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UNITED STATES ARMY

AVIATION DIGEST

NOVEMBER 1977

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UNITED STATES ARMY AVIATION DIGEST

NOVEMBER 1977 VOLUME 23 NUMBER 11

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MG James C. Smith
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U.S. ARMY AVIATION CENTER
A major activity of the
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COMMANDER
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A major activity of the
Inspector General of the U.S. Army

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ABOUT THE COVER

Illustration by Fred Martin, Fort Rucker, AL. "How To Kill A 'ZSU' " story starts on page 2

The mission of the *U.S. ARMY AVIATION DIGEST* is to provide information of an operational, functional nature concerning safety and aircraft accident prevention, training, maintenance, operations, research and development, aviation medicine and other related data.

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90th ARCOM Has A New Training-Flight Facility Complex

Major Ray Dery
Assistant Public Affairs Officer
Headquarters, 90th U. S. Army Reserve Command
San Antonio, TX

The 300th Aviation Company (90th ARCOM) was selected by the Army Aviation Association of America (AAAA) as National Aviation Unit of the Year in the Reserve component category. The Dallas, Texas unit received this prestigious award at the AAAA annual meeting in Washington, DC last month

IF YOU WANT to see Department of Defense's total force in operation, visit the Dallas Naval Air Station.

The station is home for Naval and Marine Corps Air Reserve and Coast Guard Reserve organizations as well as a new, recently dedicated U.S. Army Reserve training center and flight facility complex.

And, later this year the Texas Army National Guard plans to dedicate formally a new facility next door to the 90th U.S. Army Reserve Command complex.

Navy and Marine Corps Reserve aviators have been using the station's facilities for decades. The Coast Guard moved in 5 years ago.

The Army Reserve now has moved in and has been in operation since January 1977. The formal dedication ceremony took place in March.

The $3.9 million complex houses the 90th U.S. Army Reserve Command's (ARCOM's) 300th Aviation Company (Assault Helicopter) and the 244th Transportation Company (Aircraft Maintenance) (GS).

The flight facility also services the Aviation Section of the 493d Engineer Group (Construction), an element of the 420th Engineer Brigade.

Both the 300th and 244th conduct aggressive training programs aimed at the readiness expected of such units should they ever be mobilized.

The 300th was the first Reserve unit to reach 100 percent of its aviators qualified in nap-of-the-earth (NOE) flying. It beat the 31 December 1976 deadline set by higher headquarters.

As for those personnel entering the unit now, the 300th has two training programs for pilots. When an individual joins, a local area and currency checkout is in order.

Then there follows an instrument training program to include ground school and flying. When the latter is completed then it's NOE — during the weekend inactive duty training (IDT) and followed up during annual training (AT) if facilities and location allow it.

Continued on page 20

How To Kill A "ZSU"*

THE PRIMARY threat to the attack helicopter on the next battlefield will be the ZSU-23-4 or its follow-on replacement. Current threat doctrine places ZSUs well forward with tank and mechanized regiments. Therefore, it is imperative that the U.S. develop sound tactical techniques to destroy the ZSUs *early* in a helicopter versus tank flight.

Thereafter it should make tank killing a piece of cake!

Certain tactics and techniques appear reasonable to get this touchy tank killing business done most effectively. The thoughts I present here are based on results of recent tactics development

Continued on page 22

Colonel John C. Bahnsen
TRADOC System Manager
For The Attack Helicopter
Fort Rucker, AL

*pronounced zoo

This article is unclassified and is based on data and charts provided by TRADOC Bulletin No. 4, dated January 1976. Opinions are solely those of the author and do not necessarily represent those of DOD or other U.S. Government agencies.

Army's YAH-64: Survivable Tank Killer

John N. Kerr
AAH Program Director
Hughes Helicopters, Culver City, CA

ON 10 DECEMBER 1976, Hughes Helicopters was announced as the winner in an intensive 41-month prototype aircraft competition [Phase I] for follow-on, full-scale engineering development [Phase II] of an Army advanced attack helicopter (AAH). Designated the YAH-64, it is specifically designed to deliver antiarmor and area suppressive fire under day, night and adverse weather conditions.

The YAH-64, in the words of Colonel (P) Edward M. Brown, AAH Program Manager, represents an optimization of helicopter technology for the modern tank-heavy battlefield environment. It will contribute greatly to the Army's ability to fight, outnumbered, and win.

In disclosing selection of the Hughes AAH over the YAH-63, Edward A. Miller, then Assistant Secretary of the Army for Research and Development, noted that the YAH-64 was clearly superior in all essential parameters during the Phase I airframe qualification program.

The Phase II program will focus on fabrication of three additional flight test prototypes, completion of subsystems development – missile, cannon, rocket, target acquisition and designation systems – and their

Hughes YAH-64 advanced attack helicopter with HELLFIRE missile system mockup. HELLFIRE is being developed as an antitank weapon by Rockwell International

integration into the YAH-64.

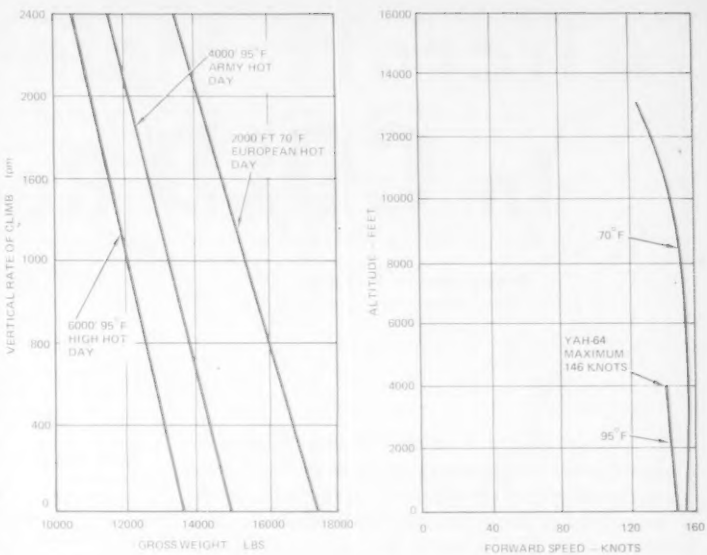
The initial Phase II contract called for a $317.7 million, 50-month program that would culminate in a production decision for 536 aircraft, to be produced at a rate of about eight units a month. First deliveries to the Army inventory are scheduled to begin in mid-1982. In February 1977, however, the amended fiscal year 1978 budget reduced funding for the AAH program. This will result in yet to be determined adjustments.

Lethal and Survivable: The YAH-64 is the Army's "first round-the-clock," adverse weather attack helicopter with the ability to fight, survive and live with ground forces in the future "frontline" battlefield environment. To achieve these objectives, Hughes placed a high priority on the following objectives:

Flight Performance: The best measures of helicopter performance, at a prescribed density-altitude, mission, weight and endurance, are vertical rate of climb from hover, cruise speed and agility (the ability to avoid enemy fire, or obstacles when in nap-of-the-earth flight). The YAH-64 excels in all of these characteristics. It offers 800 fpm vertical rate of climb, 146-knot cruise speed, 1.83 hours endurance, and maneuver load factors of 3.5 g positive and 0.5 g negative, all at 4,000 feet, 95 degrees Fahrenheit.

Firepower: The primary point target weapons of the AAH is the HELLFIRE Antitank Missile System. Area weapons fire is provided by 30 mm cannon and 2.75 inch rocket subsystems. Phase I firing of 250 rockets – in salvos of up to 76 – and 1,350 rounds from the Hughes Helicopters-developed 30 mm ATM-230 Chain Gun proved the YAH-64 to be an exceptional weapons delivery vehicle.

The primary AAH mission requirement is a 450 fpm vertical rate of climb (VROC) with eight HELLFIRE missiles and 320 rounds of 30 mm ammunition with 1.83 hours endurance at Army hot day conditions. The YAH-64 will exceed that requirement (figure 1). Alternate mission loads can include up to 16 HELLFIRE missiles, 76 2.75 inch rockets or 1,200 rounds of 30 mm ammunition.



Performance charts show the YAH-64 will exceed the Army's minimum requirements

Figure 1

Survivability: The high degree of survivability of the AAH is derived mainly from its ability to maneuver with high agility within the protection of the terrain [in the nap-of-the-earth (NOE)]. The AAH is in effect a highly mobile "ground" vehicle and derives benefits accruing therefrom: Target area approach is out of line of sight, allowing surprise as to location when attack is made, usually masked from radar (and can quickly remask), etc.

Other measures to reduce detection are provided such as a low flicker rotor; low glint canopy; low noise; metal and engine heat reduction; and the helicopter is small and compact to further reduce radar and visual detection. Operating in the NOE can be performed with high survivability to the crew in case of helicopter damage with a 95 percent probability of withstanding a crash of 28 mph.

Additionally, the HELLFIRE missile range of more than 4,500 meters permits the AAH to stand off beyond the major threat effective range of about 3,000 meters and obtain a high degree of survivability under most battlefield conditions.

Further guarantees of survivability are afforded the YAH-64 through:

- Rugged construction ballistically tolerant of hits by 23 mm HEI and virtual invulnerability to 12.7 mm armor-piercing incendiary (API) rounds.
- Redundant flight control systems.
- Self-sealing fuel cells.

Continued on page 26

See Glossary page 29

Aircraft Maintenance In COLD Regions

Major Dennis P. Vasey
U. S. Army Military Personnel Center
Alexandria, VA

CW2 James A. Fitzpatrick
HHC, 4/77th FA (PROV)
Fort Campbell, KY

A QUICK GLANCE at the world's climatic regions will show that a large portion of our land mass areas are subjected continuously or partially to arctic or arctic-like environmental characteristics. The southern limit of the arctic regions is in the 50-degree Fahrenheit (F) isotherm[1] for the warmest month, excluding areas with mean annual temperature above 32 degrees F. It fairly closely coincides with the northern limit of trees. Arctic-like areas are found in the desert and mountain areas of Oceana, North America, South America, Africa, Asia and Europe.

Photos by
CW3 Lyle M. Rizk
Fort Wainwright, AK

The term "cold regions" includes not only polar, arctic and subarctic regions, but also encompasses all parts of the Earth where severe winter conditions occur on a seasonal basis. These regions, characterized by snow, ice, frozen ground, and below freezing temperatures, cover 65 percent of the Earth's

....In isolated, undeveloped cold region areas ... airmobile operations are the only sensible options for defense...

...Many manhours are consumed in hangaring and warming "cold-soaked" aircraft.

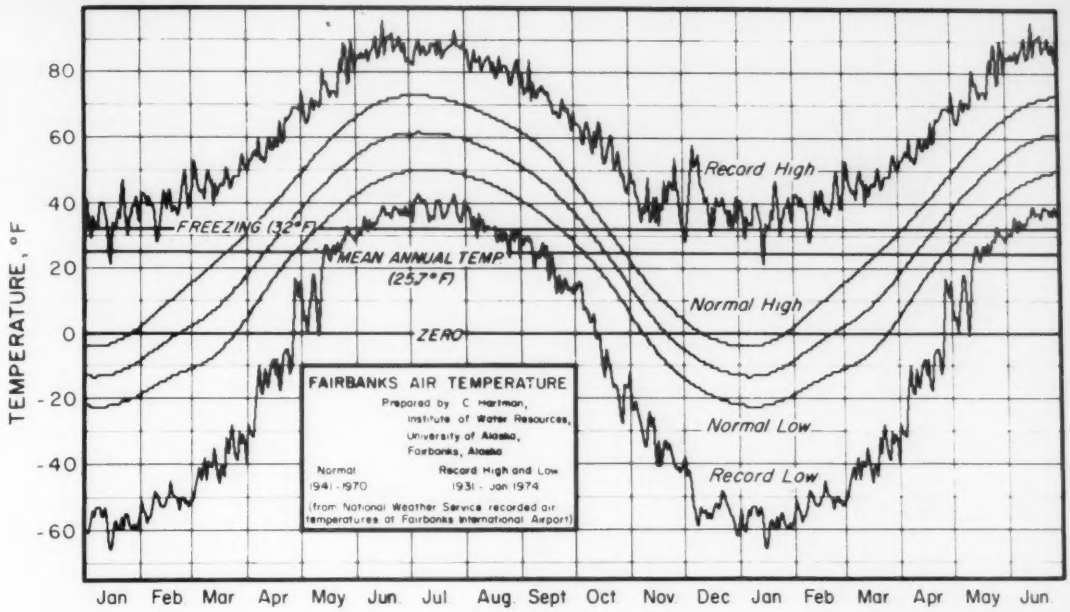


Figure 1

****

land area, including all of Greenland, Canada and Alaska; 60 percent of the remainder of the United States; 70 percent of Eurasia and high mountains at all latitudes.

Many of these areas, particularly in Canada and Alaska, lack sufficient roads and railroads to support modern operations during any season of the year. In summer, muskeg, myriad lakes and rivers, and rough mountainous terrain make cross-country movement by ground vehicles virtually impossible. In winter, deep snow, ice, extremely low temperatures, long hours of darkness and poor visibility hamper ground mobility during much of the time but create an ideal environment for airmobility.

As a result of technological advances in helicopter design and Howze Board[2] formulation of the airmobility concept, the Army integrated all the functions of combat — reconnaissance, firepower, logistics, troop movement, and command and control — into one package. Consequently, arctic and arctic-like regions, once isolated and looked upon as worthless expanses, became both accessible and of strategic importance, particularly in the northern hemisphere. In isolated, undeveloped cold region areas such as Alaska and much of Canada, airmobile operations are the only sensible options for defense.

Implied in all airmobile operations is the requirement for a well planned and carefully executed maintenance program. Under ideal conditions aircraft maintenance is a complex and difficult task that places emphasis on precision, attention to detail and a high degree of professionalism. Vietnam proved conclusively that good aircraft maintenance is not impossible when both the geography and climate are harsh. The continuum of dust, mud, heat and humidity presented many obstacles to effective maintenance. However, the climate of Southeast Asia seems mild when compared to the extreme cold of winter in the arctic, subarctic and even the continental climates of the mid-latitudes. For example, in the "Greater Interior" of Alaska below freezing temperatures occur annually from August through May.

Attempts to plan arctic or arctic-like airmobile operations based on mean annual temperatures could be fatal! The Hartman Graph (figure 1) shows record high and low air temperatures as well as normal highs and lows and the average temperature for the entire annual cycle. For easier reading, the graph extends for an 18-month period. This comparative data shows the Fairbanks, AK, mean an-

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AVIATION SAFETY AWARDS

AR 385-10 PROVIDES for four types of aviation accident prevention awards for recognizing aviation units and individuals – the Award of Merit, the Award of Honor, the Award of Excellence, and the Broken Wing.

The Awards of Merit, Honor, and Excellence are applicable to all Active Army, National Guard, and Reserve organizations having either assigned Army-owned or Army-leased aircraft. All activities (detachment, company, battalion, group, etc.) are eligible for the Award of Merit and Award of Honor. However, only company size units and above are eligible for the Award of Excellence.

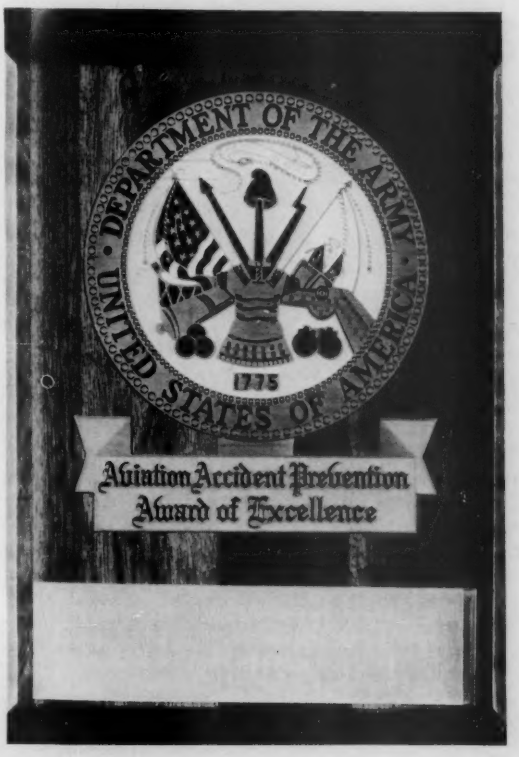
Activities that have maintained accident-free flying time during the preceding 12 or more consecutive months are eligible for the Award of Merit. Upon completion of 36 or more consecutive months of accident-free flying time, activities are eligible for the Award of Honor. The Award of Excellence is presented upon achieving 72 consecutive months of accident-free flying time. For the purpose of these awards, "accident" pertains to major and minor accidents as defined in AR 385-40.

Recently, many questions have been raised about activities receiving concurrent awards. A recommended change to AR 385-10 has been submitted and will clarify this portion of the regulation as follows:

Multiple awards cannot be obtained concurrently for the same calendar period. The Awards

of Merit, Honor, and Excellence are given only for consecutive periods of accident-free flying time and the periods cannot overlap. That is, once an Award of Honor or Excellence has been attained, eligibility for the Award of Merit will commence again until the plateau for the next higher award (Honor or Excellence) has been achieved. Awards of Honor and Excellence serve as the sole recognition for the last year of the required accident-free period. For example, a period of accident-free flying time from 1970 to 1977 would result in the following recognition:

Award of Merit 1970-1971
Award of Merit 1971-1972
Award of Honor 1970-1973 (only for the complete 36-month period)
Award of Merit 1973-1974
Award of Merit 1974-1975
Award of Excellence 1970-1976 (only for the complete 72-month period)
Award of Merit 1976-1977



The effective date of the Awards Program is 25 April 1970 and only the flying performed subsequent to this date will be considered for award eligibility. In addition, an award to a subordinate unit will not serve as the sole basis for an award to the higher headquarters of that unit.

Army activities meeting this criteria may be nominated for these awards by their next higher headquarters provided their headquarters certify that the activities are continuing to pursue active and effective accident prevention programs. Nominations must contain the unit identification code and the calendar period covered, and will be forwarded to Commander, U.S. Army Agency for Aviation Safety (USAAAVS), ATTN: Safety Awards Program Officer, Fort Rucker, AL 36362.

The Broken Wing is an individual-type award and is applicable to military and civilian personnel (including student pilots) who are authorized to pilot or serve as crewmembers of Army-owned or leased aircraft. To qualify for this award, nominees must have demonstrated the highest degree of professional aviation skill while actually recovering an aircraft from an in-flight failure or malfunction which necessitated an emergency landing. The circumstances surrounding the occurrence must not have been aggravated by self-induced factors, violation of regulations, lack of discipline or judgment, etc. The emergency and the circumstances surrounding it must, in their entirety, demonstrate the individual's extraordinary skill, judgment, and technique in analyzing and recovering from the situation. Personnel subject to situations as a result of combat or related emergencies are also eligible for the award provided they meet this criteria. Normally, only one individual will be nominated to receive the award for a single in-flight emergency. However, in those cases where more than one crewmember clearly contributed to the actual recovery, all concerned, including enlisted personnel, may be considered for nomination.

Broken Wing Award nominations may be made by any person having knowledge of the event and should be forwarded without indorsements to the Commander, USAAAVS, ATTN: Chairman, Broken Wing Award Committee, Fort Rucker, AL 36362. Nominations should contain a concise description of the event which includes those elements contained in paragraph 7-3f(1) of AR 385-10.

NAME THAT BIRD

UTILITY TACTICAL TRANSPORT AIRCRAFT SYSTEM (UTTAS) BLACK HAWK!

Mark E. Barkley
Supervisory Operations Research Analyst
and
Major Richard R. Walker
Logistics Officer
Black Hawk Project Manager's Office
St. Louis, MO

IN EARLY 1977 permission was granted to the U. S. ARMY AVIATION DIGEST to establish and publish a "Name That Bird" questionnaire to secure candidate popular names for the UH-60 Utility Tactical Transport Aircraft System (UTTAS) from the U. S. Army community at large. The March 1977 DIGEST featured an article entitled "Name That Bird" to obtain recommendations for an official name for the UTTAS. That event marked the official beginning of the search for a name for the aircraft. That AVIATION DIGEST article disclosed guidance as to the kind of terms which were permissible in the renaming of an Army aircraft. General guidance for naming Army aircraft states that a POPULAR NAME for them must be an American Indian term or the name of an American Indian tribe or chief.

..The "Name That Bird" story for the UTTAS motivated 600 individuals to submit 268 distinct popular names. A tabulation was made showing how many participants suggested each name.

The initial list of most popular candidate names was researched in the UTTAS Project Manager Office (PMO).

The resulting list of candidate names for renaming the UTTAS was forwarded to Mr. C. M. Went, Trade Mark Division, U.S. Patent Office; Dr. Ives Goddar, Smithsonian Institute; and Mr. Tom Oxendine, Bureau of Indian Affairs, to establish whether the candidate names were official Indian terms and acceptable to the involved American Indian tribes. Through the efforts of these men, many of the more popular terms such as "Commanche" and "Apache" were eliminated because of their association with other current aircraft systems.

Among the more interesting candidate names that were submitted for renaming the UTTAS were: Aleut, Cree, Frog, Hopi, Kaw, Kickapoo, Mohican, Nakoa, Opeechee, Popogou, Pomo, Puma, Sachem and Yaki. A complete list of names submitted and a bit of interesting background concerning some of the recommended names will be carried in a future issue of the DIGEST. One suggestor submitted a poem along with the candidate name. It goes as follows:

"Copters are female, like ships in the night
With their heads in the clouds and
their frames out of sight.
Little support is needed I'm told
except where they sag as they tend to get old.
Put one handsome pilot in her cabin to run
And you'll find it is worth all the joy and
the fun..."

The names on the list were further reduced by the PMO in accordance with previous guidance and for appropriateness. This effort resulted in a prioritized list of three candidate names: Black Hawk, Tecumseh, and Shoshoni. On 22 July 1977, these candidate names were forwarded to U. S. Army Materiel Development and Readiness Command (DARCOM), Directorate for Development and Engineering, Systems Development Division for approval. The names Black Hawk and Tecumseh previously were used. Sikorsky Aircraft, Stratford, CT, had copyrights to the name Black Hawk and Tecumseh Products Company, Tecumseh, MI, had copyrights to Tecumseh. But both gave the U. S. Army permission to use the names.

On 25 August 1977, the name Black Hawk was designated for the UTTAS. This term had been suggested by Mr. John T. Matlock, AVSCOM, St.

Louis, MO; Mr. Harold J. Bean, 17th Battalion, 4th Brigade, Ft. Knox, KY; Major Dennis R. Brightwell, 669 Beth Lane, Lexington, KY; Captain Bill Davison, 7th Aviation Battalion, Fort Ord, CA; and Lieutenant Colonel Frank J. Klein Jr., Operational Test and Evaluation Agency (OTEA), Falls Church, VA. The term Black Hawk was chosen over the other candidate names because it provokes one's imagination, brings to mind effectiveness, and is easy to pronounce and recall. Additionally, it reminds Americans of its namesake, Chief Black Hawk, a highly respected soldier and patriot, whose name is written in the annals of these United States of America.

Our congratulations to those who submitted the selected name.

With a Gamma Goat in tow, the UH-60A Black Hawk displays its sling load capability. More than 600 persons participated in the "Name That Bird" contest conducted by the DIGEST. Five persons submitted the winning name which was chosen from some 268 offerings

Chief Black Hawk

BLACK HAWK was born in 1767 at the Sauk village of Saukenuk, IL, near Rock Island. He died 3 October 1838 at a village on the Des Moines River, Iowa. The name Black Hawk refers to a description of a bird or sparrow hawk or a big chest.

Black Hawk fought for the British in the War of 1812. He distinguished himself as a fighter and leader. On 13 May 1816 the Sauk Indians signed a treaty at St. Louis confirming their earlier cession to the Government of most of northwestern Illinois, southern Wisconsin, and part of eastern Missouri.

"I touched the goose quill to the treaty," one of the chiefs named Black Hawk said later, "not knowing, however, that, by that act, I consented to give away my village." As settlers pushed into the territory, driving away the game and plying the Indians with alcohol, it soon became apparent to Black Hawk that the white settlers intended to have his village of Saukenuk.

Keokuk, a servile young Sauk, urged peaceable compliance with the treaty; but Black Hawk's will stiffened when he returned from a fall hunt in 1828 to find Saukenuk occupied by white settlers. In 1830 he attempted to rally support among other Indians, and in 1832 he went on the warpath. While Illinois militiamen were shooting Sauk and Foxes to persuade them to stay west of the Mississippi, in accordance with the terms of a dubious treaty, the Sauk and Fox leader, Black Hawk, was becoming a national celebrity. Defeated and captured at the end of this futile campaign — glorified as Black Hawk's war — the Sauk chief bowed to the inevitable and moved to Iowa. After his capture at the end of the war, he was taken on what can only be described as a triumphal tour of the cities of the East. In an epic poem written in his honor he was compared, "As soldier, patriot, soul magnanimous," with Napoleon and Wellington:

And sure they had no better cause,
Than fight for country, kindred, laws!

Black Hawk Dedication

Courtnay Welton
Public Affairs Office
U. S. Army Military District of Washington
Washington, DC

THE U.S. ARMY'S newest helicopter officially was unveiled 7 September during ceremonies at Fort Meyer, VA. The UH-60A, named the Black Hawk in honor of a Sauk Indian chief who lived some 200 years ago, eventually will replace the UH-1 Huey as the Army's workhorse utility helicopter.

Speakers at the ceremony included General John R. Guthrie, commander of Development and Readiness Command (DARCOM); Gerald J. Tobias, president of Sikorsky Aircraft, the developer and contractor for the Black Hawk; and Carl Thorpe, son of the legendary Jim Thorpe and a direct descendant of the helicopter's namesake. Colonel Richard D. Kenyon, the UH-60A Project Manager, served as master of ceremonies.

Mr. Tobias and GEN Guthrie both hailed the Black Hawk project as a good example of what can can be accomplished through cooperation between the Army and industry. Tobias called the project "... the most demanding and stimulating challenge in Sikorsky's history ..." and said that the Army requirements called for the most advanced helicopter in the world.

Black Hawk, The Man

Editors Note: The following comments were made by Carl Thorpe at the Black Hawk dedication ceremony 7 September at Fort Meyer, VA. Mr. Thorpe, son of the legendary Jim Thorpe, is a direct descendant of Chief Black Hawk, for whom the Army's newest helicopter is named

It is gratifying to be here as a representative of the Sauk and Fox Tribe and as a descendant of Black Hawk.

I am particularly pleased to participate in these ceremonies which bring new life and spirit to his name.

One might ask, who was Black Hawk and what is significant about him that we should honor him on this day? Most of you here can answer these questions with little problem, but to many, he is an unknown or, at best, a name out of the murky past.

To others, his name brings forth visions of a fierce, wildly painted Indian who, with his followers, roamed the plains shooting and maiming settlers and local militia alike.

To history buffs, his name and exploits are familiar as a highly skilled fighter and a defender and guardian of what he believed to be sacred tribal rights of the Sauk and Fox.

To his native American contemporaries of today, he was a man who deeply loved peace, his people and who fought diligently against the injustices of the time.

As such, and while his skin was of a different color, his purpose, motivations and actions were not unlike those of our white forefathers who also cherished peace and human rights and defended these to the death — which is today's American heritage.

I believe it is for these reasons that we honor him today. Black Hawk was of the Thunder Clan. By long tradition, clan elders gave names to newborn so that the spirit of those deceased might arise from Mother Earth and live again. These Indian names were derived from the sky, the clouds and from the birds who flew there. Often, Indian prayers for warriors going off to battle spoke to the Great Spirit in these terms.

The UH-60A helicopter today receives a proud Indian name and in the sense that a spirit is reborn, it now casts its shadow on the face of the land.

In Tribal tradition ...

To this bird we say ...

Go to the sky, to the clouds and challenge the Thunder.
Bring upon your strong wings the peace of Black Hawk.

For the Sauk and Fox, Thank you.

From the DARCOM point of view, the project was significant because it proceeded on time, within cost constraints and resulted in a superior aircraft.

The history of the Black Hawk goes back to 1965 when the first requirement document was approved. In 1971 the Army went to the aircraft industry for designs and in 1972 competitive contracts were awarded to Sikorsky and Boeing-Vertol. The first prototype flights were made in 1974, with a total of more than 6,000 hours of flying time between the two versions. Sikorsky received the production contract in December 1976, for a projected cost of $2.9 billion over the 8-year purchase period.

Production of the new model began last month, with the first delivery set for August 1978. All told, the Army plans to purchase more than 1,100 Black Hawks.

As a new generation of helicopters, the Black Hawk has increased capabilities over the Huey. It is designed to carry 11 fully equipped combat troops and a crew of 3 at a top speed of 185 miles per hour to a maximum range of 370 miles under extreme conditions. In that capacity it can carry a full rifle squad, something the Huey cannot do, in addition to the increased speed and range capabilities.

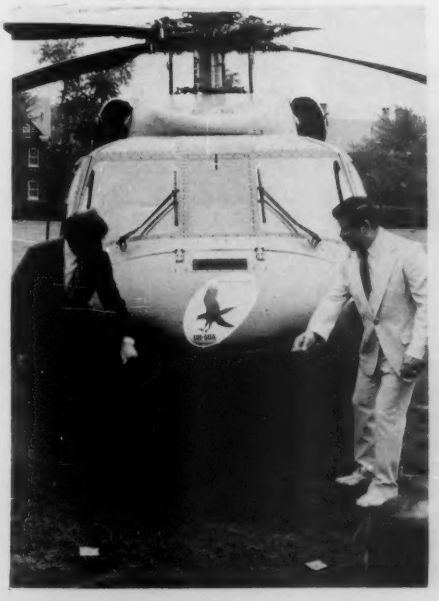
In another role, the helicopter can operate for medical evacuation and carry four patients on litters with attendants and complete medical equipment for inflight care. It also can lift a 105 mm howitzer, a gun crew of 5 and 50 rounds of ammunition.

Throughout its design and development great attention was paid to a number of "lessons learned." Many of its specifications were written for hot weather, high altitude operation and other considerations included survivability in a hostile environment, crash survivability, flight reliability and ease of maintenance.

As evidence of its crashworthiness, GEN Guthrie recounted an incident during the testing phase in which one of the helicopters had an engine failure at night at 300 feet and crashed into trees with 14 passengers and crewmembers aboard. All 14 walked away. The next day new rotor blades were installed and the helicopter took off under its own power.

Several other characteristics of the Black Hawk are indicative of its advanced technology and design. It is designed to be invulnerable to small arms fire and able to survive numerous hits from other weapons. This is due to its armor and the use of redundant systems that compensate for damage to the helicopter. For example, the Black Hawk's main transmission can operate for at least 30 minutes without any oil.

It is also much quieter than other current helicopters, can fly close to the ground and can defeat heat-seeking weaponry, making it harder to detect and shoot down.



Left: Gerald J. Tobias (left), president of Sikorsky Aircraft, and Carl Thorpe unveil the Black Hawk emblem (photo by Zack Richards). Below: Black Hawk conducts nap-of-the-earth flight (photo by Sikorsky)

DUAL TRACK 175/40 IERW COURSE

Captain Dana M. Young
Training Management Branch
Department of Resident Training Management
Fort Rucker, AL

ON 13 JUNE 1977 the first students entered the new Dual Track 175/40 Initial Entry Rotary Wing (IERW) Course at Fort Rucker, AL. The course is the result of almost two years of extensive research and replaces the 180/20 IERW program.

Developed at Fort Rucker by the Training and Doctrine Command's Aviation Training Study Group, the new course is designed to improve the graduate's capability to survive against - and defeat - the threat. The course also increases the aviator's capability to operate around the clock in all weather conditions.

Consisting of 175 flight hours and 40 hours in the UH-1 flight simulator (UHIFS) (as compared to 180 flight hours and 20 flight simulator hours in the old program), the 34-week course is divided into six phases: preflight, primary, UH-1 transition, instruments, night qualification and combat skills.

The 2-week preflight provides the student with an overview of the IERW course and presents the academic fundamentals which prepare the student for the aviation environment. Included are classes in aviation medicine and life support.

Actual flight training begins in the TH-55 Osage helicopter. During the 8-week, 50-hour primary phase of training the student is taught the basic flight skills: hovering, straight and level flight, takeoff and landing, autorotations and other maneuvers associated with rotary wing flight.

Following the primary phase the student moves into the 4-week, 25-hour, UH-1 transition phase of training. Using the basic skills developed in the TH-55, the student progresses through the requirements for UH-1 transition. The fledgling aviator becomes knowledgeable in the working systems of the UH-1 and demonstrates flight proficiency in all flight maneuvers, procedures and operational checks required for the UH-1. During this phase the student is exposed for the first time to confined area, pinnacle and slope operations.

Instrument training makes optimum use of the UHIFS during this 8 weeks of training. The unique capabilities of this device provide the student with an integration of simulator and aircraft that maximizes the use of the training time available.

Initially, the UHIFS provides the student with the basics of instrument flight. When the capability to plan an instrument flight rules (IFR) flight and to fly VHF omnidirectional range (VOR), automatic direction finder (ADF), instrument landing system (ILS), and ground controlled approach (GCA) has been demonstrated, the student begins alternating flights in the simulator with flights in the UH-1. The 20-hour UH-1, 35-hour UHIFS phase of training culminates with a 2-hour checkride conducted on the federal airway system.

The night qualification phase of training was developed to augment the requirement for aviators

to function 24 hours a day. During this 4-week, 20-flight hour portion of the course the student is taught to operate the UH-1 at night in a minimum light condition. The maneuvers learned here are basically the same as those performed during the UH-1 transition phase. Proficiency is attained in normal flight maneuvers to include: standard hovering and low level autorotations; confined area operations; and pinnacle and ridgeline operations. The last 4.5 hours of the night qualification phase are spent with the AN/PVS-5 night vision goggles (NVG). In order to successfully complete this phase the student must demonstrate proficiency in the following maneuvers: low level autorotations, NVG failure, confined area operations, reconnaissance, and pinnacle and ridgeline operations. The goggles provide yet another dimension to the round-the-clock capability of helicopter employment.

The culmination of the student's flight work is accomplished during the 8-week/60-hour combat skills phase. This phase is based out of a simulated, forward area tactical training site. The student ties together all of the previous training and is taught tactical applications of that knowledge. The training is conducted in a simulated high threat environment. Most missions must be coordinated with ground units, artillery and tac-air.

In tactics the student becomes proficient in terrain flight and low level navigations, tactical instruments, night operations and reconnaissance. Proficiency in various emergency procedures also is maintained. One of the highlights of this phase is the actual troop lifts made in support of Ranger training at Eglin Air Force Base, FL. In June 1977, for the first time, 180 troops from the 82nd Airborne Division, Fort Bragg, NC, were airlifted by IERW students in conjunction with an emergency deployment readiness exercise. The opportunity to work with ground troops in a tactical environment provides a unique aspect to the training program.

Plans also call for developing a FARRP (forward area refueling and rearming point) to be used during a 1-day exercise in the tactics phase. This exercise will familiarize the student with rapid rearming and refueling techniques in a simulated high threat environment.

Twenty-five percent of all U.S. Army students of each IERW class are chosen to participate in the OH-58 transition/combat skills course. During this phase the student receives a transition into the OH-58A Kiowa helicopter and learns the skills necessary to become a combat ready aeroscout pilot.

OH-58 Scout Pilots Awarded New ASI

A new additional skill identifier (ASI) has been issued for OH-58 aviators who receive scout training under the new Dual Track 175/40 IERW Course. OH-58 aviators trained under the new program will be designated ASI ID to identify them as scout qualified. ASI IP identifies current OH-58 aviators who are qualified in the aircraft but not scout trained. The first class of 175/40 students began training on 13 June 1977. Approximately 25 percent of that class and each subsequent class will earn the ASI ID designation.

IERW COURSE

TH-55
50 HOURS
PRIMARY

UH-1
25 HOURS
QUALIFICATION

UH-1-FS
35 HOURS
+
UH-1
20 HOURS
INSTRUMENTS

UH-1
20 HOURS
NIGHT QUALIFICATION

UH-1/OH-58
60 HOURS
COMBAT SKILLS

OPMS CORNER

Officer Personnel Management System

Aviator Notes

Major James M. Gass
Company Grade Combat Arms Division
U. S. Army Military Personnel Center
Alexandria, VA

THE QUESTION most frequently asked by aviators pertains to the need for ground assignments now that aviation is an Officer Personnel Management System (OPMS) specialty. We must address the term "need" on two levels – the individual's and the Army's. To better understand how Combat Arms Division (CAD) copes with meeting the Army's needs while trying to provide the maximum professional development opportunities for its members, the following points must be made:

• Vietnam and post-Vietnam aviation training rates have created severe imbalances in the year group (YG) strengths of aviators. YG 1970 and earlier have more aviators than there are aviation job opportunities for proper aviation career development. YG 1971 and later are understrength aviators. These officers can expect heavy utilization in the aviation specialty in order for the Army's aviation mission to be fulfilled.

• Most YG 70 and earlier aviators already have had at least one ground assignment and have commanded companies. Aviators in YG 71 and later will have diminished opportunity for ground assignments as the overstrength YGs are promoted out of the company grade ranks and per capita aviation requirements increase.

• A representative portion of company grade CAD officers are aviators. This means that many aviators are needed for nonaviation assignments (both in CA specialties, branch materiel and in other specialty requirements) to meet our share of the total Army requirements.

• It is a worthwhile and desirable goal to retain the ground orientation within our aviation corps. Those officers who have had opportunities to command as captains should make better field grade commanders of aviation units and more fully integrate Army aviation into the combined arms team. The point is that nonaviation (other specialty) duties should be viewed as worthwhile and desirable to the overall broadening of our aviators.

• Company grade command is still a desirable goal and should be sought if the opportunity is available, but since the aviation specialty command opportunities are largely in the field grade arena, a lack of command must not be considered negatively. Performance must be the major consideration in judging an officer's potential.

• Each time an aviator is due for reassignment, assignment officers must consider the above points and relate them to each individual's and the Army's needs. Career counseling and assignments may vary significantly with each individual because no two officers are exactly the same. This is the reason officers get such individualized and personal treatment from their career managers. Each time an assignment is made, the following questions are asked:

(1) What does the Army need this officer for and does this person show the potential to perform the job?
(2) What experience has this person had to date?
(3) Is this individual qualified in required specialties? If not, what type assignment is needed?
(4) How well has this person performed in past assignments? What is the officer's "gate" situation?
(5) What civil and military education level does this officer possess?
(6) What are the officer's preferences?

These are the major issues that make up the thought process of the assignment officer. Of these, the first question – Army needs – must carry the greatest weight.

A second question frequently asked pertains to the desirability of a CA specialty (11,12,13,14) and aviation (SC 15) OPMS specialty combination. There is no "right" answer to that question. The answer will vary from year group to year group. There are a number of major factors which should be considered. Among these factors are such things as:

• The utilization rates (job opportunities) for service in these two specialties diminish rapidly in the field grade years – especially for lieutenant colonels and colonels. Aviation, unlike most other alternate specialties, has decreasing positions available in those ranks. In fact, most officers with these specialties will serve in a third specialty much of their later career. When this occurs, how qualified will the officers be when competing with officers in their specialties who have considerable more experience?

• Stabilization constraints limit our ability to move officers into an environment which will allow adequate development in both specialties at *each grade level.*

• Other Army requirements often will dictate

assignment out of these two specialties and create an experience gap in one or the other of the two specialties.

- The Aviation Career Incentive Act and its expected aviation utilization rate of 50 percent along with military/civilian schooling periods, mathematically leave a marginal amount of time for experience in a CA specialty when compared with nonrated officers.
- Those who have acquired successful experience in both CA and aviation specialties will have greater opportunities for commands at the lieutenant colonel level as they can compete for both.
- Army funded advanced schooling will not be possible for the CA/15 specialty combination. The Army trains officers at the graduate level only in those disciplines which are considered shortage (Operations Research/Systems Analysis (ORSA), automatic data processing (ADP), engineering, etc) and officers selected for school must have specialties associated with those disciplines. Almost none of the Army's shortage disciplines are associated directly with CA or aviation.

As you can see, the CA/aviation (CA/15) combination will be extremely difficult if not impossible for an officer to sustain. There will be very limited numbers of officers in YG 71 and later who will be designated CA/15.

Even knowing this, we feel that those of you in YG 71 and later who desire and who have the opportunity should serve time in CA positions, company/troop command if possible. This experience, if acquired, will enhance your value to the Army because of the broad experience base; not to mention the value to you as an individual in the development of your overall leadership capabilities and experience.

Enlisted Personnel Management System

EPMS CORNER

Homebase/Advanced Assignment Program (HAAP)

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Alexandria, VA

ARE YOU GETTING ready to go to Korea? Or are you thinking of submitting a volunteer application to go to Korea? Do you know or think you know about HAAP? If so, the following information may pertain to you.

HAAP is the Army abbreviation for the homebase/advanced assignment program. It applies to Soliders in grades E5 and above who are scheduled to go to a dependent restricted area. Most of you know these assignments as short – or unaccompanied – tours, usually 12 months in length.

Many noncommissioned officers (NCOs) think that HAAP and homebase are the same. At Military Personnel Center (MILPERCEN) we often receive calls from NCOs wanting to know what their homebase will be if they volunteer for Korea, or wanting to know if they can change their homebase. Many Soldiers also are under the impression that if they go to Korea, they can get assigned to their place or area of choice. These are all misinterpretations.

HAAP means that (if you are in grade E5 or above) when you are placed on assignment instructions to a short tour area, you will know before you depart for overseas where you are scheduled to return in Continental United States (CONUS) upon completion of the short tour. There is a very big difference between a homebase assignment and an advanced assignment.

A homebase assignment means you are scheduled to return to your previous permanent CONUS duty station – that is, to the same installation you were assigned to before you received orders for the short tour.

An advanced assignment, on the other hand, means you are scheduled to return to a station/location other than your previous permanent CONUS duty station – or simply to an installation different from the one to which you were assigned prior to going on your short tour.

HAAP was initiated to help the Army reduce permanent change of station (PCS) costs. From the individual Soldier's viewpoint, it helps in making personal plans which could result in savings, fewer household moves and improved family stabilization. Anyone who has been on a short tour knows what a hassle it can be to move your dependents to one place and then a year later move

continued on inside back cover

Aircraft Maintenance In COLD Regions

Continued from page 7

Aerial view of Ft. Wainwright, AK, following ice fog

nual temperature as 25.7 degrees F and qualifies the "Great Interior" as an arctic area. When these temperatures are coupled with a windchill, chart (figure 2), equivalent temperatures may dip to -100 degrees F at anytime from November through March.

The effects of these low temperatures result in premature mechanical failures of aircraft, caused by cold-induced embrittlement of metals and plastics; malfunctioning of lubrication systems; improper functioning of fluid systems; excessive wear caused by differences in the coefficient of thermal contraction; and expansion of materials within a single system.

The effects of cold on aircraft are severe, but the effects on men are even more so. There is the ever present danger of frostbite and hypothermia[3], but of even greater significance is the fact that arctic clothing, which must be worn for protection against cold injury, is cumbersome and bulky. As a result, relatively minor tasks become difficult and time consuming. Many tasks requiring unencumbered manual dexterity such as fine tuning adjustments, removal of nuts and bolts and replacement of small parts, cannot be accomplished while wearing protective arctic mittens. Also, metals at low temperatures cannot be handled with bare hands without the risk of frostbite, and gloves thin enough to permit manual dexterity offer protection for only a very short period of time. Areas of aircraft which are accessible in normal clothing become inaccessible when wearing heavy and bulky arctic clothing; hence, such maintenance cannot be performed until the aircraft is placed in a warm hangar or shelter. As a result, many manhours are consumed in hangaring and warming "cold soaked"[4] aircraft. Rotor smoothing, a routine task in warm climates which generally can be accomplished in several hours, in cold temperatures may consume a day or longer and require hangaring for each adjustment. Further, it is not uncommon to shear an unheated trim tab while attempting a minor adjustment. In extremely cold weather there is the temptation to neglect fine adjustments or postpone them until the weather is warmer.

Unfortunately, in planning arctic or arctic-like airmobile operations the aviation commander cannot take advantage of a recent caution to job seekers which appeared in several newspapers: "If you're considering a move to Alaska, bring enough money for a round trip in case your plans don't materialize."

Fieldcraft, i.e., basic survival requirements, and thorough indoctrination of personnel is a key factor in any cold weather operation. It may be a vestigial memory of the last ice age lingering in the human mind that causes people to regard the cold with an attitude bordering on irrational terror despite the fact that a human organism is more easily parboiled than frozen.

In the long term implication for the planner, manual dexterity might be improved through the use of heated gloves. Think, lightweight heated parkas might be a solution to the cumbersome, bulky parkas which block access to many repair areas. Lightweight, easily erectable shelters or inflatable shelters offer interesting possibilities. Modules should be designed so that tools and wrench applications are not required. Finally, metal and plastic components should be incorporated in all areas that resist cold temperature embrittlement.

Perhaps in the final analysis, planning should incorporate what the planner knows about the cold and how it affects, or could affect, the mission. If the planner knows nothing, nothing should be planned!

FOOTNOTES

[1]An isotherm is a line connecting points of equal temperature.

[2]In 1961 Mr. McNamara, Secretary of Defense, directed the Army to take a new look at the ways the Army could use aircraft, specifically the helicopter, in enhancing the Army's mission.

[3]Hypothermia is a lowering of the body core temperature.

[4]When a piece of equipment reaches an ambient air temperature of 0 degrees F and lower throughout.

Figure 2

INSTRUCTIONS

MEASURE LOCAL TEMPERATURE AND WIND SPEED IF POSSIBLE; IF NOT, ESTIMATE. ENTER TABLE AT CLOSEST 5° F INTERVAL ALONG THE TOP AND WITH APPROPRIATE WIND SPEED ALONG LEFT SIDE. INTERSECTION GIVES APPROXIMATE EQUIVALENT CHILL TEMPERATURE - THAT IS, THE TEMPERATURE THAT WOULD CAUSE THE SAME RATE OF COOLING UNDER CALM CONDITIONS.

NOTES

WIND

1. THIS TABLE WAS CONSTRUCTED USING MILES PER HOUR (MPH), HOWEVER, A SCALE GIVING THE EQUIVALENT RANGE IN KNOTS HAS BEEN INCLUDED ON THE CHART TO FACILITATE ITS USE WITH EITHER UNIT.
2. WIND MAY BE CALM BUT FREEZING DANGER GREAT IF PERSON IS EXPOSED IN MOVING VEHICLE, UNDER HELICOPTER ROTORS, IN PROPELLOR BLAST, ETC. IT IS THE RATE OF RELATIVE AIR MOVEMENT THAT COUNTS AND THE COOLING EFFECT IS THE SAME WHETHER YOU ARE MOVING THROUGH THE AIR OR IT IS BLOWING PAST YOU.
3. EFFECT OF WIND WILL BE LESS IF PERSON HAS EVEN SLIGHT PROTECTION FOR EXPOSED PARTS - LIGHT GLOVES ON HANDS, PARKA HOOD SHIELDING FACE, ETC.

ACTIVITY DANGER IS LESS IF SUBJECT IS ACTIVE. A MAN PRODUCES ABOUT 100 WATTS (341 BTU$_H$) OF HEAT STANDING STILL BUT UP TO 1000 WATTS (3413 BTU$_H$) IN VIGOROUS ACTIVITY LIKE CROSS-COUNTRY SKIING.

PROPER USE OF CLOTHING and **ADEQUATE DIET** are both important

COMMON SENSE THERE IS NO SUBSTITUTE FOR IT. THE TABLE SERVES ONLY AS A GUIDE TO THE COOLING EFFECT OF THE WIND ON BARE FLESH WHEN THE PERSON IS FIRST EXPOSED. GENERAL BODY COOLING AND MANY OTHER FACTORS AFFECT THE RISE OF FREEZING INJURY.

(REVISED FROM ARCTIC AEROMEDICAL LABORATORY TECHNICAL REPORT 64-28)

CONTRIBUTORS:

ARCTIC AEROMEDICAL LABORATORY - FORT WAINWRIGHT, ALASKA

SCIENTIFIC SERVICES, 11th WEATHER SQDN - ELMENDORF AFB, ALASKA

WIND SPEED		COOLING POWER OF WIND EXPRESSED AS "EQUIVALENT CHILL TEMPERATURE"																			
KNOTS	MPH	TEMPERATURE (°F)																			
CALM	CALM														-25	-30	-35	-40	-45	-50	-55	-60
		EQUIVALENT CHILL TEMPERATURE																			
3 - 6	5														-25	-30	-35	-40	-45	-50	-55	-65
7 - 10	10										-25	-35	-40	-45	-50	-60	-65	-70				
11 - 15	15								-25	-30	-40	-45	-50	-60	-65	-70						
16 - 19	20							-25	-30	-35	-45	-50	-60	-65								
20 - 23	25							-30	-35	-45	-50	-60	-65									
24 - 28	30						-25	-30	-40	-50	-55	-65	-70									
29 - 32	35						-30	-35	-40	-50	-60	-65										
33 - 36	40						-30	-35	-45	-55	-60	-70										
WINDS ABOVE 40 HAVE LITTLE ADDITIONAL EFFECT		LITTLE DANGER					INCREASING DANGER (Flesh may freeze within 1 min.)						GREAT DANGER (Flesh may freeze within 30 seconds)									
		DANGER OF FREEZING EXPOSED FLESH FOR PROPERLY CLOTHED PERSONS																			

90th ARCOM *Continued from page 1*

With the help of the 4150th USAR School of Dallas enlisted personnel can be trained as helicopter repairers. This means spending IDT in class and then 2 weeks of AT at Fort Rucker.

The 244th also has personnel attending the repair school which is 70 hours in length. Additionally, the 244th has people attending an avionics communication equipment repairers course offered by the 4105th. This is an 80-hour course which includes an AT phase at Fort Gordon, GA.

The 244th has a unique on-the-job training program involving surplus parts and equipment.

About 2 years ago the unit obtained a salvaged UH-1B training aid and with Reservists working on the aircraft rebuilt it completely to flying status last November.

And, to further maintain proficiency the unit has obtained salvage component parts from the Corpus Christi, TX Army Aviation Depot. These include an engine, transmission and tailboom assembly.

At this writing the 244th also was attempting to obtain a salvage U-8 fixed wing plane to serve training purposes.

The 244th is only one of six USAR general support transportation companies in the country. There is only one on active duty.

The 300th, 244th and 493d moved to the Dallas NAS, located in Grand Prairie, TX, on the southwestern fringes of Dallas, from Oak Grove Airport in Fort Worth. There they operated in leased buildings.

Ultra-modern and spacious best describe the new complex.

The training center is a one-story structure of the 400-personnel variety. It has an area of 23,510 square feet and includes a large assembly hall; 1,000-inch indoor rifle/pistol range; fully equipped kitchen with separate food storage area; supply and ordnance storage rooms; classrooms and administrative offices.

The assembly hall is used as a messhall during weekend training assemblies. Foldable messtables are removed and stored easily following use.

But what is really impressive is the flight facility itself, 35,122 square feet of space. It includes a 42-foot high hangar which is 240 feet long and 75 feet deep. The 39 helicopters serviced at the flight facility all can be accommodated in the hangar. The flight facility includes separate shops for engine, propeller and rotor, sheet metal, paint, machine, avionics and gun repair.

Photos by MSG Tom Phillips, HQ, 90th ARCOM, PA office

The most popular of the rooms, however, is one used for breaks and lunch time. It contains just about every type of vending machine imaginable including a money changer.

A motor vehicle maintenance shop is attached to the hangar. It is a three-bay facility operated by the Area Maintenance Support Activity (AMSA) subshop which is responsible for motor vehicle maintenance for all U.S. Army Reserve units on the naval station and in Fort Worth.

And, of course, the 35.7 acres of land includes ample parking for private automobiles, taxiway and spacious aircraft parking apron.

U.S. Senator John Tower of Texas, speaking at the dedication ceremony, marveled at the complex calling it a "splendid facility."

The senator spoke about the total force policy and about the importance of Reserve forces in today's era of an all-volunteer military force.

"We never know when we're going to get in on some kind of dustup that's going to require that we supplement our regular military forces with our Reserve," he said, adding, "Because we do not initiate war as an instrument of national policy we must be ready when it comes...what you do here is enormously important and this facility gives us the kind of modern asset required to maintain these companies with the kind of preparation they will need at such time

Above: Senator John Tower does the honors during the traditional ribbon cutting assisted by (left to right) MAJ Gerard Stokley, 300th commander; MG Warren E. Myers, 90th ARCOM commander; LTG Allen M. Burdett Jr., 5th Army commander; Chaplain (COL) Arthur B. Ingalls, 362d CA Brigade; and MAJ James Armacost, 244th commander

Left: Size of the flight facility hanger is exemplified in this overview of the dedication ceremony. In the background is a new Cobra gunship (AH-1S) which was on display

as they may be called on to perform in a very active role...."

Another highlight of the dedication ceremony was presentation of two aviation safety awards to the 300th Aviation Company.

LTG Allen M. Burdett Jr., commander of Fifth U.S. Army, presented a plaque emblematic of the Department of the Army Aviation Accident Prevention Award of Excellence and the Forces Command (FORSCOM) Commander's Trophy for Aircraft Accident Prevention to Major Gerard Stokley, the 300th's commander.

The 300th earned the first award for recording 72 consecutive months of accident-free flying and in doing so logged 23,000 hours, ending 30 June 1976.

The unit won the Commander's Trophy in competition with other Reserve aviation companies during fiscal year 1976. The 300th's pilots flew 4,123 hours without an accident or incident during that period.

MG Warren E. Myers, 90th ARCOM commander, was master of ceremonies at the dedication and the previous day presented Army Commendation Medals to five personnel for actions concerning the saving of lives.

Honored were Major Stokley, CWO Danny E. Goss, and Specialist Fives Carl E. Bonifas and Walter L. Croom, all of the 300th; and CWO Billy J. Choate of the 244th Transportation Company. Also presented an Army Commendation Medal in absentia was CWO George R. Bryant of the 300th.

MAJ Stokley, CWO Choate, and SP5s Croom and Bonifas were cited for rescuing two men from a rain-swollen creek in Tarrant County, TX, in April 1976. Two helicopters had to be used, one to pull the men out using a rescue basket, and the other to provide visual assistance because of electrical wires and trees.

CWOs Bryant and Goss were on a routine training flight in February 1977 when they sighted a house trailer afire near Crowley, TX, and seeing no assistance at the scene decided to land their helicopter.

While landing they spotted a man leaving the trailer from a window and collapsing nearby. They rushed to his aid, pulled him to safety, rendered first aid and returned to the blazing trailer to shut off the gas.

On the advice of an emergency medical technician who arrived with the fire department, the helicopter crew then flew the injured man to a Fort Worth hospital.

At the time the chopper carried four passengers who assisted. They were two active Army ROTC advisors and two ROTC cadets from Bishop College in Dallas.

Because the 300th's primary mission is to transport personnel rapidly for deployment on a mid-intensity battlefield, the unit's training program is geared towards the high threat environment.

For example, the company's annual training program calls for 100 percent instrument and NOE qualification. And, throughout individual, platoon and unit training the advanced techniques which would be used in combat are employed and perfected.

The best test of the company's capabilities on the mid-intensity battlefield occurred at Fort Chaffee, AR during August when it supported the Arkansas National Guard's 39th Infantry Brigade. The 300th, as part of an active component aviation battalion from the 101st Airborne Division, helped the Brigade conduct Army Training and Evaluation Programs (ARTEPs) for its Cavalry squadron, Infantry battalion and support battalion.

The unit's helicopters were used throughout the annual training period for air assault and other troop carrying missions using the latest techniques including the contour and low flying NOE concept. The 300th worked with Pathfinders and conducted several night missions. Also scheduled were briefings on the high threat environment and enemy capabilities.

How To Kill A "ZSU"

Continued from page 3

and evaluations (TDEs) that have given the Army new insights into "how to fight" using attack helicopters versus armor. Only lately have articles begun to appear on this subject. And, not everyone agrees with what has been written – just as there are those who will differ with thoughts I present. But, look upon this article as openers, if you like – a think piece intended to stimulate discussions. Constructive contrary opinions are not only sought, but also encouraged, solicited and will be printed.

Characteristics Of A ZSU: First, aviators need the ZSU's characteristics and habits firmly in their data banks before going after the beast. A tank battalion or a motorized rifle battalion normally will have two ZSU-23-4s (1 section) located within 400 to 500 meters of the lead elements of an attacking formation. Each weapons system has four 23 milimeter (mm) automatic weapons and a fire control (Gun Dish) radar mounted on a lightly armored, full tracked vehicle [see "Self-Propelled Antiaircraft Gun," March 1976 *DIGEST*] The radar range of the weapon is 3,000 meters plus and its optical range exceeds 2,500 meters. It has a 360-degree traverse capability.

Helicopter crews should also avoid being at ranges between 2,000 and 2,500 meters if they are exposed to the ZSU for more than 35 seconds. The weapons lethality drops off at ranges farther than 2,500 meters although radar and visual acquisition is possible at considerably longer ranges. At ranges less than 2,000 meters, the lethality of the ZSU is extremely high, *and in this area aviators must avoid any exposure to the weapon.*

ZSU-23-4 Effectiveness In A Nutshell:

- *The ZSU is a highly lethal weapon.*
- *Its effectiveness falls off sharply beyond 2,500 meters.*
- *ZSU-23-4 can acquire, lock on and fire at a target in about 35 seconds.*
- *ZSU is less effective against a maneuvering helicopter than one that is hovering.*
- *ZSU's effectiveness is reduced as target's exposure time is decreased.*

Other Vulnerabilities Of The ZSU: There are several distinct vulnerabilities of the ZSU that can be used to our advantage. *First*, the Gun Dish radar makes it a distinct signature vehicle in a formation of tanks or Soviet personnel carriers. It stands out clearly and nothing else in that area of the battlefield will cause aviators to mistake a ZSU's identity.

Second, the ZSU is not heavily armored and several of our weapons systems will destroy it. The most vulnerable part of the vehicle is the Gun Dish radar which can be made inoperative with artillery fragments, mortar, rockets, 20 and 30 mm projectiles and numerous other type weapons. But they can still kill

you with visual acquistion and tracking.

Third, the capability to hit targets at greater ranges drops markedly if the radar is inoperative.

Fourth, we know that while on the move it is not as effective as when stationary (this is true for a lot of threat weapons systems).

Fifth, the radar gives a distinct paint on the radar warning receivers found in U. S. Army helicopters.

There probably are other significant vulnerabilities, but the five areas above give us something to work with in tactics.

How To Locate A ZSU: Probably the most difficult job helicopter pilots will have is locating the ZSUs. *I highlight the plural*, as ZSUs are employed in pairs at a minimum. So it's a multiple job.

Locating the quarry falls to the scout helicopters and every other intelligence source available in the battle area. However, for the purposes of discussion, let's limit the job to aeroscouts.

Visual search is the primary means of locating threat vehicles. Scouts, mounted or dismounted, will do this job. Additionally, radar beams picked up by the radar warning receiver (AN/APR-39) mounted on the helicopter provide a good indication of direction and location of the ZSU. However, to get such a signal, helicopter exposure is necessary.

Keep in mind that radar acquisition is greater than the firing range so the enemy can paint you at a longer range. When ZSU tracks you, you get its direction. Depending on the range from the ZSU and the exposure time, this could be dangerous business. Two scouts working together can be particularly effective in this operation. One scout observes while the other acts as a decoy, attempting to either draw fire or get a paint on the radar warning receiver. No doubt a stationary, camouflaged ZSU is going to be the most difficult to locate. Also, the enemy can be sneaky by turning off the radar and using visual tracking. But usually this is done only at closer ranges.

Destruction Of The ZSU: Indirect fires are probably the most cost effective means of killing a ZSU. If the target is within range of supporting Artillery, the scout can use this firepower to get the job done swiftly, efficiently. However, in some situations it is possible that the ZSUs in question are out of Artillery range. This might be true in penetration scenarios where the enemy has moved into friendly rear areas and the situation is confused.

Close air support is the next possibility for attacking the ZSU. If available, this is a quick, effective method. But the target must be handed off to the forward air controller and the fighters must locate the culprit in question – a not easy chore on the smoke filled battlefield. However, the U.S. Air Force has special mission aircraft to assist in this type mission.

Use Of Attack Helicopter Teams: Probably the surest way to kill a ZSU is with a tube-launched, optically-tracked, wire-guarded (TOW) missile launched by an attack helicopter. The possible time lag required for Artillery and close air support to get on target makes the attack helicopter the quickest way to get the job done.

Accuracy and time of flight of the TOW make it well suited for the job. A hit will be a kill!

Use of 2.75 inch rockets fired in an indirect mode is certainly possible and definitely a safer way to go. However, the rocket system is an area weapon and is not as sure as the TOW. Possible development of a 2.75 inch radar seeking warhead would make this a more potent weapon against the ZSU.

During the kill phase assaulting a ZSU, attack helicopters are placed in position to pick up the target handed off by the scout. The scout then can either move to a nearby observation position or act as a long range decoy to distract the target. Of course, this decoy work is done outside the optimum lethality range of the ZSU. If at all possible, simultaneous engagement of all ZSUs by multiple attack helicopters will get the job completed best.

No doubt this is hazardous business. However, it appears to be absolutely essential for attack helicopters to be fully effective tank killers on future battlefields. No other threat weapons system can so hinder attack helicopter operations as can the ZSU-23-4. Careful, quick, deadly removal of these weapons makes destruction of other enemy targets a lot safer. *That is if any battlefield can be described as safe!*

Think These Points Over:

- The ZSU-23-4 has proven to be an effective killer of aircraft.
- The U. S. Army has good helicopters with excellent weapons that give us a range advantage.
- We must know what we are looking for.
- We must use terrain to minimize exposure.
- We must operate at maximum standoff where our weapons have high probability of kill and the enemy's weapons probability of kill is reduced.

What Are Your Thoughts? Either write an article or letter expressing your opinions on the tactical techniques, problems, advantages, etc., of attacking the ZSU and send them to the *AVIATION DIGEST*, P.O. Drawer P, Ft. Rucker, AL 36362. Your opinions will be welcomed, appreciated and responded to.

Flight Dip

DID YOU EVER walk on a flight line during a morning launch? When 80 or 90 aircraft are being launched twice daily, it gives you the opportunity to see two unique scenarios – at times resembling a precision drill team – at others, a daredevil meet.

Yet before the field is abandoned and the sky becomes crowded with "check intercoms" and "say again," all after good mornings, let's peek in on the wonderful world of "rapport" that sometimes exists between Joe Pilot and Mike Maintenance.

Maintenance views the pilot's locker room – flight operations – with the flight commander as head coach giving the team its half time "pep talk" – *subject:* Nuts, Bolts, Screws and Tolerances That Will Baffle The Opponent.

At the maintenance rally, pilots envision doubletalk classes – classes on "How To Lie and Cheat Convincingly," speech therapy classes and pronunciation of words such as "salaminger" and "kinniper pin," without stammering or laughing.

The maintenance goal is to turn out the safest possible aircraft. I'm sure no one actually believes maintenance would deliberately turn out an aircraft with known flight defects. Any flight discrepancy found during an inspection must be test flown first, and maintenance is not in the habit of flying unsafe aircraft.

The human error factor is always present in maintenance. An attempt at reducing this factor is in our system. The example of aircraft tail No. 66-00001 coming into PE (periodic inspection) will fill our needs.

Technical inspectors (TIs) initially find many discrepancies behind panels aviators never have seen and in places they never knew existed. A team chief assures the work of those who are correcting the faults on the TI's "gig" sheet. The same technical inspector pulls an "in-progress" and final inspection to assure the work of the team chief. A test pilot is assigned to the aircraft; this person's preflight checks the TI.

The next stage is the crewchief performing a daily inspection. Probably the most important check is the pilot's Flight Readiness Inspection; this is a daily evaluation of the "wear-and-tear" on aircraft. The Flight Readiness Inspection is a maintenance aid because by finding faults between the 100-hour PEs, parts can be ordered and repairs can be made, thereby reducing the downtime during PE.

The maintenance public relations program is geared to pleasing the aviator. This is an idea too often overlooked for reasons sometimes excusable, but sometimes not so excusable.

Maintenance is constantly harrassed by availability. Commanders always are screaming about the importance of the number of aircraft. Eventually the launch officers become involved. But certain pilots who are continually finding minor faults will drive the launch officers to the point that they would rather ground the ship than use the 2408-13 and fly the mission.

In the same light, we have pilots who are ahead of their scheduled flight times and would rather sit on the ground at home plate than at some hot, dusty stagefield. Only in such a circumstance do they spend extra time preflighting in hopes of finding one red X. Little consideration is given for the efforts of the maintenance team in general or for the launch officer in particular. The rejection of one aircraft can have some far reaching repercussions.

In the same respect, the pilot's responsibility lies not only in a good preflight to ensure No. 66-00001 will keep flying, but also that all discrepancies are noted on the 2408-13. This -13, constantly checked and corrected, gives the pilot a more enjoyable flight by eliminating pinpointing radio problems, unusual vibrations, or instruments spinning round and round during an instrument approach.

How many of us don't take the time to "jot down" those annoying problems? Perhaps if the previous pilot had had the courtesy to pencil-in those aircraft problems, you wouldn't have a headache today.

Most units have a section called "The Pilot Pleasers" or unscheduled maintenance crew. Every launch will find one officer, one E-6 or E-7, and five or six mechanics detailed to this duty. A good unit will use its most diplomatic officer, its best NCO in terms of "getting the

Line Diplomacy

Captain Joseph Buchheit
U. S. Army Transportation School
Fort Eustis, VA

work done," and its most experienced mechanics.

Why "The Pilot Pleaser?" The reason is one of time. Simple maintenance corrections normally can be made in one-half hour; more than one-half hour requires replacement of the aircraft. This is where the experienced mechanics become "timesavers." By doing the job quickly and correctly the first time, aircraft downtime is minimized and more mechanics are available for other problems.

Diplomacy seems like a strange word to use in aviation. But is it really?

Let's take a look at a typical launch. Time is 1300 hours. It's a sparkling 90 degrees and the humidity swims at 85 percent.

Joe Pilot is sweating feverishly in his seat at flight operations. The air hangs still across the field as his students enter the building. He's been having a rough time with student No. 2; doesn't seem to be ahead of the aircraft.

During the question and answer period, No. 2 isn't responding and it is obvious No. 2 didn't study last night. This makes Joe's job twice as difficult because not only does he have to teach the lesson while he's flying but he has to explain all those terms No. 2 should have learned last night. The temperature inside Joe's head is 5 degrees higher than outside now.

The flight commander walks in and begins his own question and answer period. That's right ... Joe's No. 2 fails to answer two questions right off the bat. Now Joe has to see the "Old Man" and the day is getting hotter. It seems No. 2 didn't realize how far not studying last night would reach.

As you have guessed by now, Joe received a lovely lecture on the influence he's not giving No. 2. In fact, his whole family background has been questioned. This sets the scene for Joe Pilot's meeting with cheerful, friendly Mike Maintenance.

Mike didn't have such a good morning. There were some bitter words exchanged over the breakfast table. He left the house in a huff – a 26-mile endurance course awaits his wheels. Around mile 4 the air conditioner belches the last of its cold air and dies.

About now Mike and Joe are at equal temperatures. The next scene is the "battlefield" or flight line.

Joe has been looking over the rotor head of his UH-1 Huey for 15 minutes trying to find something wrong, when Mike walks over to the aircraft. Now the questions start flying: "What's the tolerance on this trunnion?" Feels like too much play here, will you check it? Is this safety backwards? Isn't this a red X?"

Mike gets the feeling Joe doesn't want to fly and says just that!

Joe confides in Mike the story about No. 2 and how they're "up" on time. Joe would rather reject the ship than battle the heat, crowds and stupidity of No. 2. "Could you be a pal and red X the ship for me? I won't even ask for a replacement."

Cheerful, friendly Mike Maintenance calmly explains to Joe exactly what will happen if the aircraft is rejected. Joe tries the belligerent approach which begins to boil Mike's blood. Calmly, Mike tries another approach going into greater detail about changing parts, cost, the supply system and any other resource he can muster. What a way to make a living!

When pilots have mechanical problems, sometimes a reassuring "okay" from a friendly, experienced maintenance officer can be extremely comforting. There's nothing worse than flying an aircraft you're not sure is safe.

At times, convincing pilots that their aircraft are safe can be an extremely trying job. Many times tempers rise and words of endearment are exchanged.

A diplomatic launch officer can make the difference between a "*flying pilot*" and a "*pilot flying his aircraft.*"

Maintenance versus pilots will not work. What is needed? A closer coordination with plenty of understanding for the system is one answer. The other answers are the many ways maintenance personnel can alleviate pilot problems together with those ways pilots can help maintenance to do its job.

"Good maintenance + Helpful Pilots = Safe Aircraft."

Will it work? Certainly! Whenever we try!

Survivable Tank Killer

Continued from page 5

- Armor protection of critical components.
- Blast shields for crew protection (figure 2).

Ballistic survivability tests conducted during Phase I showed that the YAH-64 could take a "worst case" 23 mm HEI main rotor blade hit and continue to operate 10 times longer than the Army specification required. Further, the main transmission demonstrated that it can lose its lubrication and continue to fly for more than an hour – 100 percent greater than the Army specification.

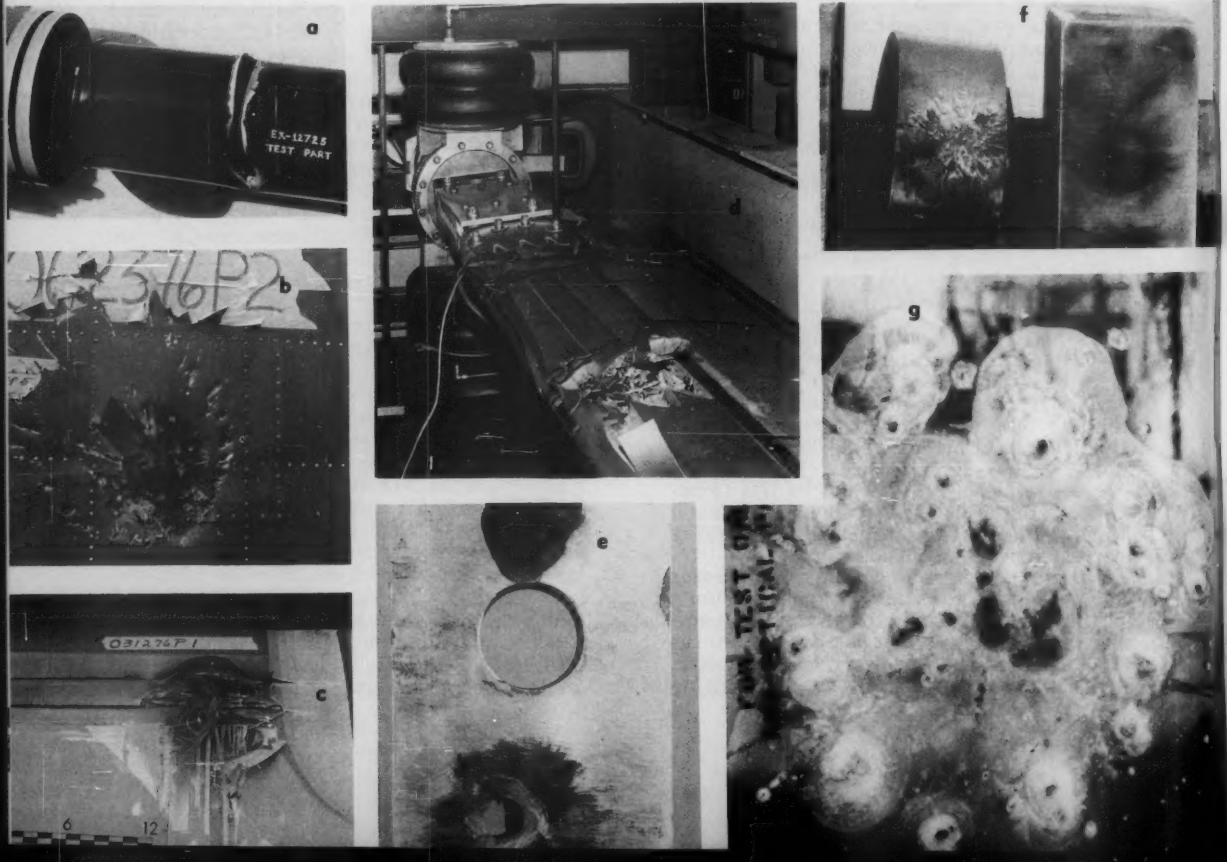
Reliability, Availability, Maintainability: Much attention was given to reliability, availability and maintainability during YAH-64 design. Source Selection Evaluation Board operational suitability specialists indicated that the YAH-64 is the most outstanding helicopter they have seen for meeting the NOE mission and ease of maintenance in the forward battle area.

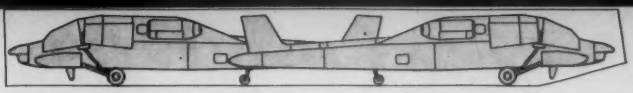
During government flight test evaluation last summer, the YAH-64 demonstrated an exceptionally good availability rate. Contributing to its reliability and maintainability are its simplicity, rugged structure, low vibration levels, fault detection/location system, static mast, lack of lubricated bearings in the rotor head, sealed grease-packed tail rotor and intermediate gearboxes, independently removable dynamic components, and easy access to all inspection/maintenance points. Time to refuel, rearm and return to battle are optimized for maximum combat effectiveness.

Deployability: With a ferry

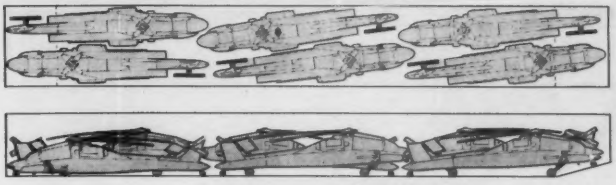
Figure 2

Inherent survivability of the YAH-64 is reflected in this series of photos of various components that were fired on during vulnerability tests and continued to operate satisfactorily: (a) tail rotor drive shaft; (b) fuel cell; (c) main rotor blade; (d) main rotor blade following 5-hour post-firing fatigue test; (e) structural aluminum alloy component; (f) electro slag remelt (new steel process) bearing sleeve; and (g) cockpit intercompartment blast shield.





C-141 - 2 EACH



C-5A - 6 EACH

The YAH-64 can be prepared for air transport with minimal disassembly

Figure 3

range of more than 800 nautical miles, the YAH-64 has the capability to be self-deployed to many potential battle areas in a matter of hours. Where more rapid response is needed over longer stage lengths, the AAH can be loaded aboard C-141 and C-5A transport aircraft in significantly less than the maximum time allowed by Army specifications (figure 3).

Success of the YAH-64 during Phase I is attributed to Hughes Helicopters' AAH team approach. Under Hughes design and management, development of the YAH-64 employed the best engineering and manufacturing talent of a carefully selected group of aerospace company subcontractors. This afforded an engineering and production capability that no single firm could provide. Fourteen major subcontractors were included on the Phase I Hughes AAH Team. Phase II major members of the team are listed in figure 4.

Phase II includes modification of the ground test vehicle and two flight test aircraft fabricated for Phase I, as well as the construction and test of three new prototype aircraft. The GTV will be updated to reflect continuing refinement to drive and propulsion systems.

Initial Phase II milestones provide for the most efficient buildup of personnel by Hughes and its subcontractors to keep the program on schedule and to enable Hughes to effect the necessary interface between the air vehicle development and that of the HELLFIRE modular missile system and target acquisition and designation/pilot night vision systems (TADS/PNVS).

Phase II flying was begun last February. Changes which were defined during and following Phase I testing will have been incorporated into both flight prototypes. The aircraft are being flown with most of these changes.

Principal design refinements consist of raising the main rotor 6 inches, incorporating a swept tip into the main rotor blades, increasing the tail rotor diameter by 3 inches and changing the horizontal stabilizer slightly.

Raising the rotor will further enhance negative g capability for NOE flight (figure 5). Even though this necessitates limited disassembly for air transport by C-141, the YAH-64 still can be prepared for loading and unloading in less time than the Army specification allows.

By sweeping the main rotor blade tips higher, maximum speeds will be obtained at lower vibration levels. Modification of the horizontal stabilizer will enable a weight decrease in that area as well as affording – in conjunction with the tail rotor change – improved responsiveness and stability.

The next major program milestone will be the incorporation of AAH mission equipment. The Army in October 1976

Figure 4

Phase II Major Team Members

Advanced Structures Division, TRE Corp.	rotor blades
Aircraft Gear	intermediate and tail rotor gearboxes
Bendix	power generation system and drive shafts
Bertea Corporation	hydraulic actuators
EEC/Burtek	panel trainers
Garrett Corporation	pressurized air, ECU and APU
Honeywell	integrated helmet automatic display sighting system
Litton Precision Gear	main transmission and engine nose gearbox test
Lockheed Aircraft Services	trainers
Menasco	landing gear
RCA Government and Commercial Systems	automatic test equipment
Rockwell International, Missile Systems Division	HELLFIRE missile equipment
Sperry Flight Systems	automatic stabilization equipment and multiplex
Teledyne Ryan Aeronautical	airframe
Teledyne Systems Company	fire control

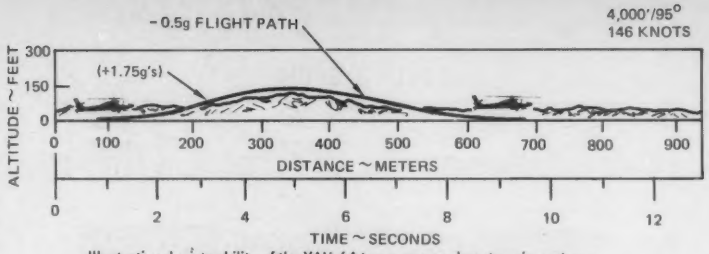


Illustration depicts ability of the YAH-64 to maneuver along terrain contours to avoid detection and evade enemy fire

Figure 5

awarded Rockwell International's Missile Systems Division the HELLFIRE contract. On 10 March 1977 the Army selected from among seven proposals those of Northrop Corporation and Martin-Marietta for a 3-year TADS/PNVS competition. Hughes Helicopters, as the prime contractor, has the responsibility to integrate these competitive systems into the overall weapon system, and to perform flight test before Army selection for production is made.

First flight of the completely equipped vehicle will be in early 1979. The full systems-equipped ship will include the 30 mm and rocket area weapons systems and the HELLFIRE point target missile. It also will include TADS/PNVS as well as complete fire control, navigation and the communications systems. The three new Phase II YAH-64s are scheduled to fly in early 1980. They will be used for thorough subsystems and weapons systems qualification testing.

Hughes flight testing, as in Phase I, will be conducted at Hughes' Palomar Airport Test Facility, near Carlsbad, CA, with initial weapon tests performed at the U.S. Marine Corps' Camp Pendleton range near Oceanside, CA. Final Hughes tests will be at the Army's Yuma Proving Ground in Arizona.

The Army will conduct periodic development and operational test evaluation flights at Edwards Air Force Base, CA; Fort Lewis, WA; and Fort Carson, CO. Additionally, the schedule calls for climatic hangar tests at Eglin Air Force Base, FL, and inflight icing investigations at Moses Lake, WA.

The Phase II program is intended to result in a YAH-64 that is fully tested and qualified for production. In parallel with vehicle development, Hughes will perform a design to unit cost program and a pre-production engineering program (PEP) to assure that cost goals and schedules are met.

Concurrent with the hardware design, Hughes is developing and testing a support system that will deliver material, personnel and documentation as an integrated system for turnover to the Army with the weapons system.

The heart of this activity is a Logistic Support Analysis Program that assures designers and support personnel will participate in support system tradeoffs on the drawing board where design considerations to enhance supportability can be made at minimum cost. The Logistic Support Analysis team and other support personnel are charged with role playing the part of individuals and units in the field who eventually will maintain the equipment.

These groups have a direct line to top management for decision on potential support problems when they cannot be resolved at the working level. Maintenance mockups, models and demonstrations on the air vehicles are used to verify approaches that cannot be analytically proven or solved.

A major challenge to the designers and support personnel during the present phase of the program is optimization of the fault detection/location subsystem. This integrated system will use personnel (crewchiefs and flight crews) at the AVUM level to interpret through simple diagnostics (primarily automatic) those components malfunctioning.

The actual troubleshooting and repairs to the components will be accomplished by specialists at the AVIM (intermediate) level using automatic test equipment (ATE). The YAH-64 will be the Army's first aircraft to be supported by ATE in the field.

In addition to developing the support system, Hughes will train Government personnel prior to Army testing. About 11 different maintenance MOSs will be trained and about 40 Army aviators and copilot gunners will be checked out prior to the various engineering and development tests.

Hughes design and test engineering activities during the

Agility and responsiveness of the YAH-64 enables it to operate safely and effectively in nap-of-the-earth environment

development of the YAH-64 have been conducted in accordance with the System Safety Program requirements of current military standards. Various types of hazard analyses have been conducted concurrent with all design and test activities to identify interrelated areas of degradation, human errors or failures that could potentially result in hazardous conditions. Specific actions were then taken to eliminate or control these hazards. As a result of these efforts, safety features such as the use of air-driven pumps to reduce ignition energy sources in the fuel system, have been included throughout the YAH-64 design.

A recent Hughes Helicopters' analysis of YAH-64 design data versus mishaps data covering a period of more than 7 years on existing Army aircraft of similar complexity showed that the estimated average flying hours between mishaps for the YAH-64 will be 60 percent more than the 7-year overall average for other aircraft.

Of some significance in selection of the YAH-64 for the AAH role was the 30 mm Chain Gun invented by Hughes Helicopters' Ordnance Division. The Chain Gun is a lightweight, simple, chain driven weapon. It has fired more than 500,000 rounds in less than 4 years of development, with up to 20,000 rounds between stoppages. Hughes is managing the 30 mm ammunition development program under a separate Army contract. The Army has specified a requirement for a round that is interoperable in NATO standard ADEN and DEFA guns. This program will include development and production of the target practice round, a high explosive round and a shaped charge, dual purpose round.

In managing the AAH Phase II program, Hughes will expand and improve upon a computerized management control system identified as Project TEAM. Through a centralized computer program, Hughes will receive from each of its subcontractors on a weekly basis the lastest status of program elements, such as cost, schedule, proposed design changes or potential problem areas. Team members will have access to their portions of the status updates through their own desktop computer terminals. But only Hughes will be able to extract total program data from the system.

The Army's advanced attack helicopter represents a new generation in technological and operational requirements. Through innovative design and management, Hughes Helicopters will fulfill those requirements within Army time and cost controls.

GLOSSARY

AAH	advanced attack helicopter
ADEN	British version of the DEFA
API	armor-piercing incendiary
APU	auxiliary power unit
ATE	automatic test equipment
AVIM	aviation intermediate maintenance
AVUM	aviation unit maintenance
DEFA	French 30 mm gun system for fighter aircraft
ECU	environmental control unit
fpm	feet per minute
GTV	ground test vehicle
HEI	high explosive incendiary
HELLFIRE	helicopter launched fire and forget
mm	millimeter
MOS	military occupational specialty
mph	miles per hour
NATO	North Atlantic Treaty Organization
NOE	nap-of-the-earth
PEP	pre-production engineering program
RAM	reliability, availability, maintainability
TADS/PNVS	target acquisition and designation system/pilot night vision system
VROC	vertical rate of climb

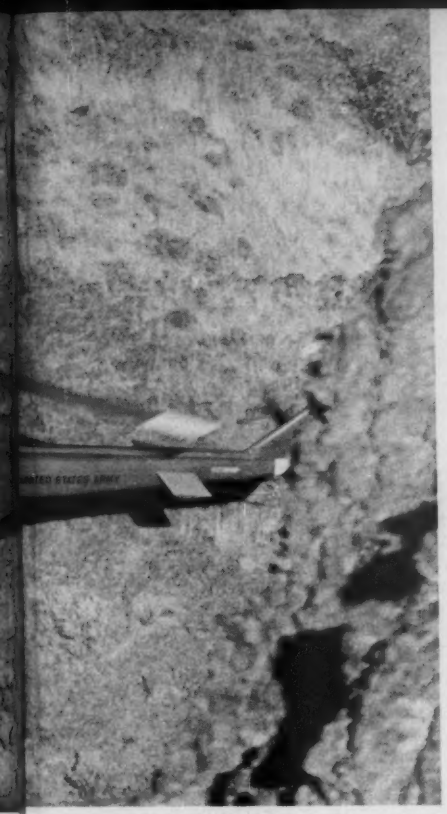
AAH ARMAMENT OPTIONS=MISSION FLEXIBILITY

MISSION				PERFORMANCE VROC	V CRUISE	ENDURANCE
ANTI-ARMOR (DEFENSE) MID-EAST PRIMARY MISSION 4000'/95°F	4 HF	320 RDS	4 HF	700 FPM	146 KTS	1.83 HRS
EUROPE ALTERNATE 2000'/70°F	8 HF	1200 RDS	8 HF	600 FPM	146 KTS	2.5 HRS
COVERING FORCE (AIR CAV) MID-EAST ALTERNATE 4000'/95°F	4 HF	777 RDS	4 HF	450 FPM	146 KTS	1.83 HRS
EUROPE ALTERNATE 2000'/70°F	4 HF 19 RKTS	1148 RDS	4 HF 19 RKTS	450 FPM	146 KTS	2.5 HRS
AIRMOBILE ESCORT MID-EAST ALTERNATE (4000'/95°F)	19 RKTS	416 RDS	19 RKTS	450 FPM	146 KTS	1.83 HRS
EUROPE ALTERNATE (2000'/70°F)	38 RKTS	788 RDS	38 RKTS	450 FPM	146 KTS	2.5 HRS

The YAH-64 provides a broad range of armament options to satisfy specific mission requirements

Mountain flying skill and know-how

When flying in mountains, even under ideal meteorological conditions, pinnacle, slope and ravine operations demand strict pilot attention and skill as well as mechanically sound aircraft to ensure safety



1. Mountain operation
2. Pinnacle
3. Slope
4. Ravine
5. Accident

A CIRCUS PERFORMER walking a tightrope, an artist trying to produce his best work, an athlete attempting to win a race, and an aviator flying in remote mountainous areas are all under strain. The only difference is that an aviator is under more than mere stress because his life and aircraft are at stake. While a circus performer, an artist and an athlete are tops in their fields, the aviator must top them all when he pits his skill and aircraft against the mountains. The following accident gives a bird's-eye view of some of the problems aviators face when flying in the mountains.

Before taking off in a Huey on a photographic service mission in mountainous terrain, the pilot estimated his gross weight to be between 9,100 and 9,200 pounds. Although concerned about the amount of equipment and number of personnel on board, he performed a go-no-go check and felt he could still fly the mission safely.

When the aircraft reached the mountain range, which was about 10 miles from the takeoff point, a high recon was made and a suitable dropoff site was selected for the photographers. The copilot attempted an approach to the southeast but aborted at 50 feet agl due to insufficient left pedal. He then made an approach to the southwest but also had to abort because of a fast rate of closure. The pilot then took the controls and landed in a westerly direction on the mesa at an altitude of about 6,200 feet msl. Two photographers got off and the pilot then flew west about 5 miles to locate positions for two other aircraft.

During approach into a proposed site, the UH-1 spun about 630 degrees to the right because of insufficient left pedal. At this time the aircraft was 20 to 50 feet above the ground and spinning at approximately 15 degrees per second. The pilot lowered collective and flew out of the area. Just before the spin, it was estimated that the aircraft was pulling 45 pounds of torque.

The crew then decided to burn off fuel to reduce aircraft weight. After flying for 30 minutes, they returned to the mesa to pick up the two photographers who had completed their filming. They remained on the ground for 15 to 20 minutes and the pilot kept the operating rpm at 6600 to burn off more fuel. A pretakeoff check was made and the aircraft was brought to a 2- to 3-foot hover. Torque was just below 40 pounds, N1 was well below the red line, and egt was slightly over 500 degrees C. Therefore, the pilot decided not to perform a complete go-no-go check.

A normal takeoff was made and translational lift was reached after about 10 to 15 feet of forward flight. The pilot then applied forward cyclic and increased power to 42 pounds of torque to gain airspeed. The aircraft began to settle, so a small amount of aft cyclic was applied. By this time, the aircraft had traveled 50 feet and attained 10 to 15 knots of groundspeed.

On approaching the edge of the mesa, the pilot felt a weak gust of wind and the nose of the aircraft started to move right. The pilot added left pedal, which hit the stop as the aircraft reached the edge of the mesa. The aircraft started to turn right and the pilot tried to compensate for the situation by adding left cyclic. The aircraft failed to respond and spun 90 degrees right. The nose dipped downward and the pilot applied aft cyclic to level the aircraft. As the aircraft completed a 360-degree turn, the pilot tried to reduce power but could not as he was over a slope with a dropoff. The aircraft continued to spin and began to pitch and yaw vio-

lently. The pilot rolled off throttle and the aircraft crashed left skid low and bounced forward on the right skid.

Fortunately, neither the crew nor passengers were injured and the aircraft sustained only minor damage. However, similar accidents have had catastrophic results.

At the time of the accident the gross weight of the aircraft was 8,769 pounds, density altitude was 6,100 feet, and pressure altitude was 5,900 feet. The UH-1 Operator's Manual cautions about left pedal travel limitations above 5,000 feet. The caution on page 14-4 states that at high altitudes and loadings where directional control is marginal, simultaneous climb and acceleration takeoffs may result in loss of control at a height and airspeed from which recovery is not possible. In addition, paragraph 7-13 states there is insufficient left pedal to maintain directional control when hovering or making takeoffs or landings in adverse winds at weights above 8,300 pounds at 5,000 feet and lower weights at higher altitudes. Paragraph 3-40 of the manual also describes directional control problems that may occur at high gross weights and density altitude. The directional control problems associated with the UH-1 at high gross weights, high altitudes and in adverse winds detracted from its suitability to perform this mission.

A qualified weather forecaster said that with the prevailing winds and topographical features at the crash site, the winds may have been as strong as 20 to 30 knots at the edge of the mesa and wind eddies both crosswind and downwind probably existed. The winds at the edge of the mesa would have been approximately from the west northwest or from 30 to 80 degrees off the nose of the aircraft which was on a departure heading of 205 degrees. Paragraph 3-40 of the operator's manual states that under these conditions, marginal tail rotor control of less than 10 percent may be available depending on wind velocity, density altitude, gross weight and rotor rpm.

There were several causes for this accident but the more prominent ones were inadequate unit training and improper supervision. Neither pilot had adequate mountain flying training or experience to fly this mission. The pilot had no mountain flying experience and the copilot had not flown in the mountains for 8 years. Although this unit operated in mountainous terrain, the commander failed to provide his pilots with mountain flying training and briefings. In addition, the unit SOP did not address high altitude or mountainous terrain operations in accordance with paragraph 3-1c, AR 95-5. Neither pilot had read or been briefed on the cautions and warnings in the operator's manual concerning left pedal limitations under certain gross weight, density altitude, and wind conditions. They disregarded these limitations during flight planning, then used poor judgment by continuing to fly without sufficiently reducing their gross weight after experiencing left pedal problems on the first two approaches to the mesa. Because of inadequate training, the pilot added unnecessary power to gain forward speed when taking off from the mesa which caused loss of directional control due to insufficient left pedal.

Aircraft performance is affected by varying altitude, temperature, wind and aircraft load. In addition to knowing the direction and velocity of the wind, an aviator must vary his aircraft load to correspond with altitude, temperature and wind conditions. Because winds are extremely tricky and dangerous in mountainous areas, every effort should be made to determine existing conditions before takeoff and while en route. Weather forecasters can provide general information, but accurate information for the specific area of operation is not available through this source. In areas of operation where ground communications exist, aviators should contact those on the ground to determine the existing wind conditions.

Windsocks are the next best avenue for determining wind conditions and should be installed at LZs where repeated operations are conducted. Unfortunately, these sources are not always available so the aviator must use visual cues to estimate wind direction and velocity.

Next to the windsock, smoke grenades provide the most accurate indication of wind direction and velocity. In light wind, smoke will rise vertically with very little horizontal movement whereas in strong winds it will disperse horizontally with very little vertical movement.

Unusual atmospheric conditions in mountainous areas are the rule rather than the exception. An aviator who operates in the mountains must know the capabilities and limitations of the aircraft he is flying, must have acquired precision inhandling the controls, and must have mastered the basic techniques of flying to the extent that they are instinctive with him. Without this know-how and skill, safe mission accomplishment is questionable.

USAAAVS

the copilot

IF IT HAD not been for my copilot, this mishap could have easily terminated in a major accident instead of an incident. After we lost hydraulics, the controls were so difficult to move that I had to have his assistance to make a significant change. But more importantly, he tuned the radios and made all the emergency checks listed in the checklist. He had been monitoring my navigation and when the emergency arose, he assumed navigation and directed me to the nearest suitable landing area...."

"...I always leave the flaps down until I reach about 300 feet after takeoff. Much to my surprise, we had barely become airborne when the copilot raised the flaps. By the time I reacted, we had lost so much altitude that I almost hit the perimeter fence...."

Who is this individual we call copilot who, in one situation, saves an aircraft and crew from disaster while, in another, triggers the events that lead to an accident? When is he required? What are his duties?

The prefix "co-" is a shortened form of "com-," meaning "together with, as in co-operation." Logically then, the copilot is the assistant pilot. Under provision of AR 95-1, he is required for all fixed and rotary wing aircraft being flown into known or forecast instrument conditions. (This requirement is waived for OV-1 aircraft when mission requirements dictate otherwise.)

But since a major portion of our flying is accomplished with a copilot on board, what are his duties? If you are expecting a "laundry list," I'm sorry to disappoint you, but there is none – not at the Department of the Army level, anyway. How, then, is the copilot to know what is expected of him? To answer this question, let's first consider the pilot's duties.

AR 95-1 states that the commander places full responsibility on the designated pilot in command who is final authority for all aspects of the operation, servicing, security, and hangaring or parking of the aircraft. That statement embraces a lot of territory – preflight, use of checklists, flying the aircraft within its envelope, passenger briefings, compliance with regulations – you name it. It's the pilot's responsibility. What he requires of his assistant, the copilot, depends on the particular situation. That's the way it should be. Only after an analysis of his own experience and proficiency; the experience and proficiency of his copilot; and the area of operations, flight conditions and mission requirements can the pilot logically determine the appropriate duties for his copilot. Some general and specific duties could be appropriately included in local SOPs as copilot responsibility. This inclusion might be of particular value in areas where aviators regularly fly the same type, model and series aircraft on similar type missions.

General duties might require the monitoring of engine and flight instruments, as well as the pilot's navigation, and watching out for other aircraft. Specific duties might include the clearing of weapons systems (using checklist) prior to entry into cantonment areas, tuning and operating radios during emergencies and disembarking and monitoring refueling operations.

But regardless of the duties assigned a copilot, one point must be emphasized: *The key to proper use of copilots is briefings.* These briefings must be conducted in a thoroughly professional manner, and they must be programmed into the *preflight* planning phase – not conducted in the cockpit as an afterthought or, worse, neglected. This procedure will eliminate or reduce confusion in the cockpit, promote competence and foster confidence between the pilot and his key man, the copilot.

Intersection takeoff left insufficient runway for safe landing after No. 1 engine crankshaft sheared

forgotten species?

WHAT HAPPENS when the incidence of some common disease suddenly rises to epidemic proportions? Or when some new strain of virus surfaces? The medical profession musters its forces in an all-out assault. Pathologists, medical researchers, technicians and a variety of specialists join in the battle to determine causes, develop cures and devise preventive measures.

We follow the same basic approach when Army aviation safety is threatened, concentrating our efforts in those areas of greatest need. This is as it should be. However, this procedure diverts our attention from other routine responsibilities. If our attention is diverted long enough, problems may arise in areas that were virtually problem free. Worse yet, these problems can develop so subtly, without triggering any alarm, that we may fail to notice them until they become formidable ones. The process is much like corrosion that begins so slowly as to go unnoticed until, suddenly, it envelops the object it attacked.

In Army aviation, it is a relatively simple matter to identify a problem area after it reaches a critical point. The trick, of course, is to spot trouble during its incipient stage – before it can establish a toehold. To do this, one of the principal tools we rely on is statistics. For example, if figures show we are having an abnormally high number of tail rotor failures associated with a particular model helicopter, even though these failures may be occurring in widely dispersed aviation units, we can be reasonably certain we have a trend – and a problem. But it is much more difficult to identify a potential problem area when it is a general one in which mishaps have no particular common denominator. A look at some recent statistics can serve as an example.

During the period 1 October 1976-12 August 1977, Army aviators were involved in 69 accidents that resulted in 23 fatalities, 43 injuries, and a cost of nearly $14½ million for destroyed and damaged equipment.

The helicopter was involved in 56 of these mishaps and fixed wing aircraft in 13. Heading the list was the UH-1, with 24; followed by the OH-58, 12; AH-1, 9; TH-55, 7; and CH-47, 4.

In the fixed wing department, we find that U-21, U-8, T-42, and OV-1 aircraft were involved in 3 accidents each; and the U-10 in 1 for a total of 13.

During this period, helicopters logged nearly 7 times as many flight hours as did fixed wing aircraft, and made more than 17 times as many landings.

On examining these figures, we can readily concede that, in the interest of safety, operations involving rotary wing aircraft should demand the greater part of our attention. After all, these aircraft comprise the bulk of the Army inventory of

USAAAVS

Aerial and close-up views of U-8 that crashed after fire caused engine to fall free from mount

Oil cans stored in adjacent compartment (former battery compartment prior to aircraft modification) leaked oil and helped feed fire

aircraft, log the greatest number of flight hours, subject themselves to a wider variety of risks and do so almost routinely. In addition, consider the types of missions in which they may be employed: training and field exercises, reconnaissance, rescue, troop carrier, cargo transport, administrative, assault and ground support, to name a few. Further, the very nature of their operations in low level, contour, and in more recent years, nap-of-the-earth flight greatly increases the risk of mishaps, and as statistics show, we can expect the helicopter to be conspicuous in a greater number of accidents than its counterpart.

In contrast, the fixed wing aircraft represents a relatively stable platform. As a rule, it requires less maintenance than a helicopter and, with the exception of the OV-1, is used primarily in training and administrative type missions. These aircraft log a small portion of the total flight time of all Army aircraft, fly at relatively high altitudes as opposed to low-level operations, have superior weather capabilities, and most are twin-engine craft capable of single-engine operation. Consequently, they are not subjected to nearly as much risk as are rotary wing aircraft. Logically, then, we can expect them to be involved in fewer accidents and to demand less of our attention than helicopters.

But let's examine our statistics a bit more closely. While the helicopter was involved in a little more than 4 times the number of accidents as the fixed wing, it flew nearly 7 times the number of hours and made more than 17 times as many landings – despite greater exposure to risk. But even this is only part of the picture. Delving a bit deeper into statistics, we note that the 13 fixed wing accidents resulted in 12 fatalities for a rate of .92 fatalities per accident as opposed to 11 fatalities produced by the 56 rotary wing mishaps for a rate of about .20 fatalities per accident.

Although we may be tempted to take heart in that no nonfatal injuries resulted from the fixed wing mishaps while the rotary wing ones produced 43, we can't in clear conscience do even that; for while all nonfatal fixed wing accidents produced no injuries, every fatal one left no survivors. In these accidents, either no one was hurt or everyone was killed. Could it be that we have allowed ourselves to be distracted too much and too long from this important area of operations? Has the fixed wing aircraft become the forgotten species? Maybe it's time to take a closer look at this accident experience.

In one fatal accident, a fixed wing aircraft crashed uncontrollably after an engine failed internally and caught fire. The extreme heat weakened the supporting structure, allowing the engine to fall free, causing loss of aircraft control.

Can we logically expect fixed wing aircraft to be involved in fewer accidents and to demand less of our attention than helicopters?

FORGOTTEN SPECIES?

On the surface, this accident appears to be an unfortunate instance of sudden materiel failure. However, a history of the aircraft shows that engine problems existed for months. These included vibration, surging, backfiring, and momentary cutting out in flight. All six cylinders on one engine had been changed and the other engine replaced following internal in-flight failure. But the problems continued.

The trouble stemmed from induction problems caused by defective carburetors. Materiel failure of the engine most probably resulted from detuning that occurred during those periods of excessive engine vibration, surging, cutting out, and severe backfiring.

In another instance, a fixed wing aircraft with several occupants crashed into a mountain at an altitude of 10,000 feet. The crew had been cleared at that altitude, under radar control, to their first intersection. However, the MEA beyond the intersection was 13,000 feet. The crew neither requested nor was given a clearance to the appropriate higher altitude, and proceeded on course at 10,000 feet after radar control was terminated.

Both crew error and controller error were instrumental in causing this accident – crew error in that the crew proceeded past a fix below the MEA without requesting a higher altitude; and controller error in that the aircraft was cleared at an altitude below the MCA for that leg. A shift change of controller personnel at the time the aircraft crossed the intersection added a complication that contributed to controller error. At any rate, human error on the part of both flight and ground personnel resulted in this catastrophic accident.

Further, human error, either singly or in combination with other cause factors, was instrumental in the majority of all the fixed wing accidents. In one instance, when the IP gave the pilot a simulated No. 1 engine failure during takeoff, the pilot elected to land the aircraft. However, he had already retracted the gear and the aircraft was landed gear-up, causing major damage. Both the IP and pilot failed to realize the gear had been raised when the IP initiated the engine failure. A contributing cause factor was that the IP was conducting training from the left seat and had not been evaluated performing IP duties from this seat position.

In another somewhat similar accident, the IP was demonstrating a night single-engine approach and landing, with the pilot reading the checklist. The IP failed to ensure the gear was down and landed gear-up. The aircraft skidded approximately 1,000 feet, sustaining major damage.

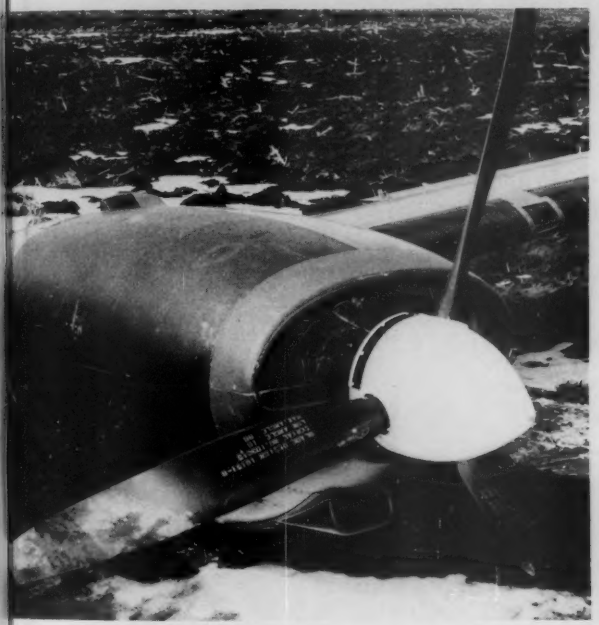
A third accident closely paralleled these two. The IP gave the transition pilot a simulated engine failure on the downwind leg of the traffic pattern. When the field was assured, the final landing checklist was completed. The aircraft had excessive airspeed at roundout and the IP heard and felt the tail drag the runway. The aircraft landed gear-up. No warning horn was heard. The preliminary report indicates the landing gear switch and warning horn may have malfunctioned.

On another training flight, an airplane was leveled off to cruise at 4,000 feet agl. The pilot then switched from main to auxiliary fuel tanks. Fuel pressure fluctuated and the engines ran rough. When the fuel selector was repositioned to main, both engines failed. The aircraft was landed wheels-up in a plowed field, damaging both props and the bottom of the fuselage. The cause? The IP failed to refuel the aircraft.

Materiel failure led to another accident. In this instance, an aircraft had just taken off when the IP heard a loud noise and the aircraft yawed to the left. The IP assumed control of the aircraft, lowered the gear and landed. During rollout, the aircraft plowed through two fences, shearing the nose gear and causing extensive structural damage before coming to rest approximately 5,100 feet from the takeoff point.

The cause of the emergency was materiel failure of the No. 1 engine crankshaft which sheared, causing the propeller and hub to separate from the engine. However, the IP had elected to initiate takeoff from the runway intersection, denying himself the use of approximately 2,000 feet of

Minutes after takeoff, U-8 made unscheduled landing because of fuel exhaustion



runway. Damage costs exceeded $100,000. This type of accident recalls to mind the wise philosophy embodied in the saying coined by yesteryear's aviators: "Runway behind you is like dirt over you." It's still good advice.

Finally, the following accident, although simple in nature, serves to point out human errors that are somewhat difficult to cope with. A hard landing occurred during training in short field landing techniques, blowing out the nose wheel tire and driving the right main gear strut into the wing, causing heavy damage from the fuselage midsection throughout the entire right wing. The initial human error was the student pilot's sudden action in erroneously reducing power at a critical point of landing. This error was then compounded by his holding the power levers in the near-idle position, preventing the instructor from adding power in time to avoid the accident. While recommendations include keeping instructors constantly on the alert for student errors, the use of verbal techniques as well as physical ones for taking over control of the aircraft during critical maneuvers is strongly urged.

On further examination, we find that none of the fixed wing accidents that occurred during training produced injuries. All the fatalities occurred in those accidents outside the training environment. Human error shows up as the predominant cause factor although maintenance deficiencies and materiel failures were significant in some of the accidents.

We might do well to ask ourselves how many of these mishaps could we possibly have prevented had we devoted additional attention to our fixed wing operations. While the time frame covered is too short to produce truly meaningful statistics, we do appear to be lax in certain areas that can adversely affect safety.

These include the need for a positive attitude among maintenance and flight crews. And this, of course, requires effective command supervision. If more training is needed in some specific area such as maintenance, then let's provide that training. If more stringent supervision is required to ensure that regulations are obeyed, TM procedures followed, and checklists and preflight inspections performed by the book, let's provide that also. The point is that we must not be led into complacency by relying on the somewhat forgiving nature of a fixed wing aircraft coupled with our highly skilled aircrews. Accidents can and, as shown, do happen in every type of aircraft when we permit conditions that cause them to develop.

Curiously, another observation made from studying the data compiled was that most of the accidents occurred during the period of March through July, with December being the next highest accident-producing month. That time of the year is now upon us, and it may be prudent of us to check our operations for any changes needed to nip potential accident-producing cause factors in the bud before they have a chance to sprout into mishaps.

ARMY

USAAAVS

A SPY IN THE COMPANY

GENTLEMEN, the commander!"

Smartly, our group came to attention. We'd heard the new commander was a real stickler for discipline. The word was out that the wrath of the gods could be quickly aroused by courting his disfavor.

"Take your seats!" The deep resonant voice filled the dayroom and it was hard to accept the fact it came from one so small in stature and unimposing in appearance. He was new, having assumed command of the battalion only a week before, and he carried the stigma of the unknown. Yet, as fast as he had inspected the companies, our grapevine was faster. Thirty minutes after he walked into Headquarters and Headquarters Company, he relieved the commander. In Alpha Company, the first sergeant was relieved. At Bravo Company, the maintenance officer and a technical inspector were ousted. Now we, the officers and men of Charlie Company, sat in stunned silence, wondering who was going to get the axe today.

"Today, I have seen the most ready company in the battalion." He paused and glared at us. "Unfortunately, I do not mean combat ready! I mean ready to have accidents!" His steel eyes raked over us and he hammered his fist into his palm.

"I've seen the signs in this company that point directly to breakdowns in discipline! I've seen haircuts that exceed the limits prescribed by regulation! I've seen messy uniforms and officers and enlisted men smoking in and around helicopters! I've seen personnel backing wreckers between helicopters without ground guides! I've seen mechanics installing a tail rotor with a torque wrench that was dropped on the work platform!"

He paused again and his voice lowered, "What should I do? I could relieve a few people and administer article 15's, or I might be able to make a court martial stick on grounds of dereliction of duty." He shoook his head and continued, "However, I have a surprise for you. The most important man in the Army aviation safety program is currently assigned to Charlie Company and he's watching all of you for me. I'll not tell you whether he's an officer, a warrant or an enlisted man. But let me assure you, he is assigned!"

A sudden hush filled the dayroom as we sneaked furtive glances at each other. What was this? Since when did we have spies assigned to watch an outfit? Who the devil could it be?

"In closing," the colonel continued, "let me tell you about an old pilot I once knew who had been flying since 1909 and claimed to have received his flight instruction from the Wright Brothers. At the time I knew him, he was over 70 years old and still flying. I asked him how he could explain living so long in an occupation which is considered hazardous even today. Looking me in the eye, he said, 'I have never demanded more from any airplane than it could give!'

"That old pilot learned early in his career that disciplined flying is safe flying. What do we mean by discipline? Discipline is doing what you are required to do, when you are required to do it, in the manner in which it is required to be done. I shall demand disciplined flying from all of you!"

Once again, we snapped to attention as the colonel stepped from the stage and marched briskly out of the dayroom. I guess I don't need to tell you about the comments that were made after he left. There were statements like, "Lifer!" and "Back to the brown shoe Army!" Our new commander had come on strong and he had a reputation for not saying things he didn't mean. I think what really had everyone rattled was the idea of a spy from the safety program being assigned to Charlie Company. We were a tight little group. We worked good together and our accidents weren't all that bad. Oh, we'd had more than our share, but we flew a lot of hours on some pretty tough missions.

You could almost feel the difference in the company after that meeting. It was as if we didn't trust each other because no one knew who the spy was. But I'll have to admit that things improved. Salutes

became a lot snappier and haircuts came back within prescribed limits. Uniforms seemed to have sharper creases and not so many grease spots. I even saw some spit-shined boots among the older men. Eventually, I started to feel esprit de corps forming from an attitude that seemed to say, "We'll teach them to send a spy to Charlie Company!"

When I started a helicopter, someone would appear out of nowhere with a fire bottle – not a little one, but the big rollaround jobs we're supposed to use. One wrecker driver got the worst chewing out I ever heard for leaving a transmission assembly suspended on the hook while he took a smoke break. The operations officer and the weather detachment started giving briefings that were really briefings. If maintenance said operations could only have five aircraft when they asked for six, there weren't any arguments.

Then it happened and, of all people, it had to be me it happened to. I had a date Friday night with one of the most beautiful girls you can imagine. In fact, I'd had the ring in my pocket for a week and meant to ask her to marry me that night. The weather was bad that morning and we hadn't been able to get off the ground. Then, about noon, the sun burst through and I drew a mission. I tried to talk the operations officer into sending someone else, but it seems the passengers I was to fly had flown with me before and asked for me.

Well, no sweat. I had plenty of time to make it before my date. That is, until we got the chip detector light on final at our destination. The crew chief checked the plug after we landed, and there were some fine metal flakes on it. Not a lot, but it was more than normal fuzz. That's where I contracted get-home-itis. I knew better, but everything was all set for my big date – reservations at the club, our favorite band and the ring. The crew chief didn't like it but I was the pilot and I decided we would return to home base.

Twenty minutes after takeoff, we got another chip light, but this time it was followed by the weird silence of total engine failure. There just wasn't time to find a place to put it down, so into the trees we went. I remember thinking this kind of thing only happens to other pilots – not to me!

Fortunately, I was the only one to get hurt and I'm thankful for that. The accident investigation board said that if it hadn't been for the crashworthy fuel system, we probably would have burned and that would have finished me. I was caught by the left leg and couldn't get out until the crew chief and copilot bent the airframe away from my broken leg.

I've had lots of visitors here at the hospital, my ex-girl for one. She came to tell me she was going to use the date that night to let me know she was marrying someone else. Of course, my buddies and the company commander have been in. Then, one afternoon, the colonel came to give me the axe.

I felt sure I'd have to face an FEB, but I had a surprise for the old man. "Good afternoon, sir," I said. "Guess I pulled a no-no, didn't I?"

"Yes, mister, I guess you did. How's the leg?"

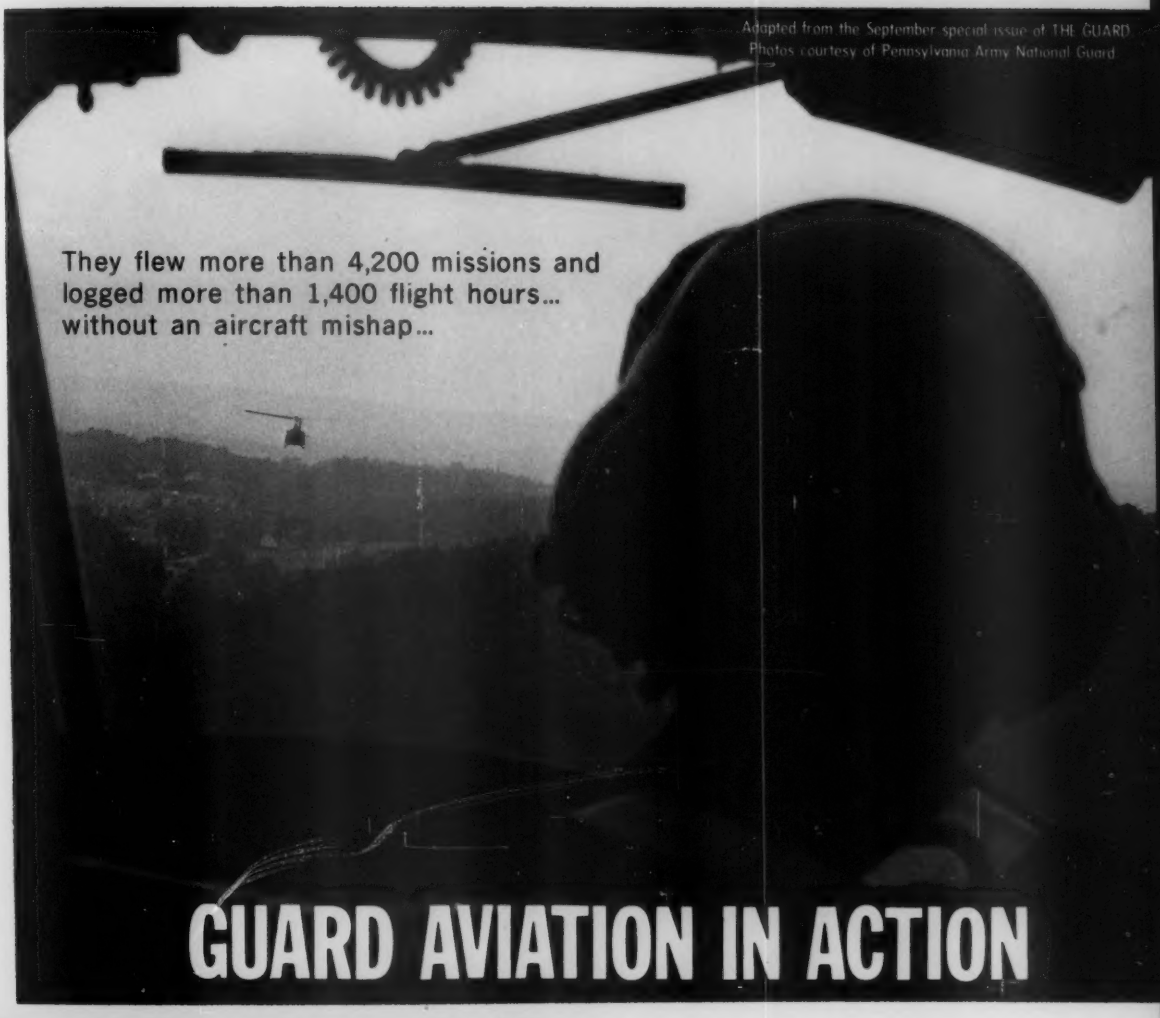
"Sir, my leg is going to be okay. But, more important, I'm going to be a different man and a better pilot from now on. You see," I continued, "I know who the most important man is – the spy you sent in on us. I feel stupid for not figuring it out long ago."

"Go ahead," he said. "Tell me who he is."

"Okay, sir," I started. "It's me and every other individual in the outfit. It wasn't any outsider at all and it wasn't really any one person. It's everyone who works around or in aviation, because they're the ones who prevent accidents. I don't care how much data you gather or how much research is done, it's still the guy who makes it, fixes it, services it, schedules it or flys it who causes mishaps that turn people into statistics, and every single man who does his job right is the most important man in aviation safety. Right, sir?"

He didn't answer with a yes or no. He just looked at me and said, "Mister, you came a long way up by going down." Then, can you believe it? He shook my hand and smiled. The old man actually smiled.

Adapted from the September special issue of THE GUARD
Photos courtesy of Pennsylvania Army National Guard



They flew more than 4,200 missions and logged more than 1,400 flight hours... without an aircraft mishap...

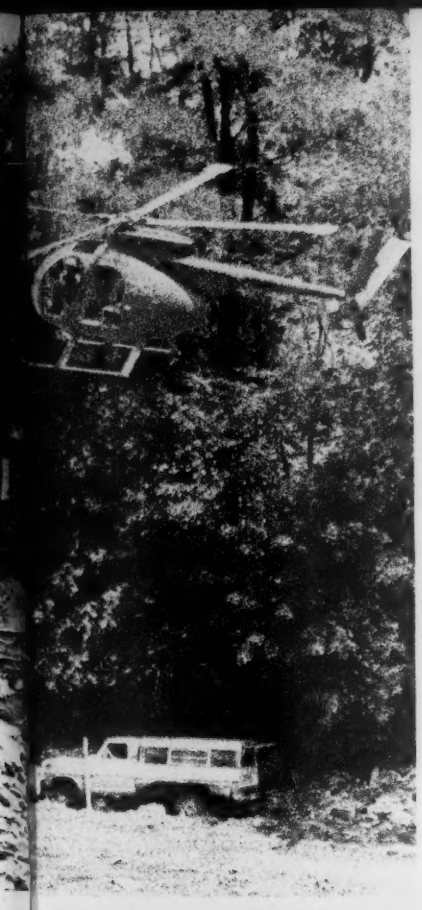
GUARD AVIATION IN ACTION

IT WAS TUESDAY, July 19. Weathermen were forecasting that Johnstown and vicinity would be hot and humid with the threat of heavy thunderstorms at night. A not unusual forecast ... thunderstorms and torrential rains are a part of summer.

The potential for serious trouble came at 1830 when the first rain began to fall. No one was really concerned. Storms pass and

Above: Basements, lawns and the road were completely washed away in the heavily damaged community of Tanneryville when the Laurel Run Dam broke and sent a wall of water 15 feet high sweeping through the narrow valley community below it.

Left: Guard pilots fly low over rain-swollen creeks as they look for flood survivors.



Johnstown is flood proof ... the people thought.

But the rains kept falling.

The National Weather Service alerted the population of a possible flood. By 0230 Wednesday, July 20, Johnstown was under water. Johnstown got 8.9 inches of rain. At the Laurel Run Dam, 5 miles northwest of Johnstown, 11.5 inches of rain had fallen.

Johnstown flooded because of its position in a river valley basin. The town is built around the meanderings of the Conemaugh and the Little Conemaugh Rivers. The heavy rainwater rolled down the hills that surround Johnstown, into the rivers and through the city.

Cars, homes and businesses were destroyed.

The most serious damage and greatest loss of life was caused by the collapse of the Laurel Run Dam. The collapse sent a 15-foot wall of water, mud and debris hurling down the valley northwest of Johnstown. The small community of Tanneryville was engulfed by the rushing water.

By 0800 Army Guard Chinooks of the 228th Aviation Company of Fort Indiantown Gap were pulling survivors from the rain-swollen rivers and streams of the Conemaugh Valley. The unit was brought in from annual training at Fort A. P. Hill, Virginia. It was joined by the 28th Infantry Division Artillery Air Observer Battery of Hershey, and Troop D of 1st Squadron, 104th Armored Cavalry, Washington, PA. At the height of the crisis, 144 aviation-related members of the Pennsylvania Army Guard were working in the flood zone.

For many of the Guard aviators, 90 percent of whom are Vietnam veterans, the Johnstown flood was the third major Pennsylvania flood they had participated in during the last 5 years. But, unlike the Agnes flood in 1972, and the Eloise flood in 1975, the Guard, with greater aviation assets, was ready this time ... they had the manpower, equipment and expertise to immediately respond to the emergency.

And respond they did.

- Pilots used the same techniques they had developed in Vietnam ... hovering at tree-top level and below to rescue more than 200 people from rooftops and trees where they had scrambled to safety. Without doubt, the helicopter crews kept the death toll much lower than it could have reached had they not been available.
- 55-gallon drums, cut out like buckets, were used at the ends of hoists to rescue children and babies.
- More than 500,000 pounds of cargo, food, clothing, water, generators and other emergency equipment were airlifted by the Guard.
- More than 3,400 passengers were transported by Guard choppers.

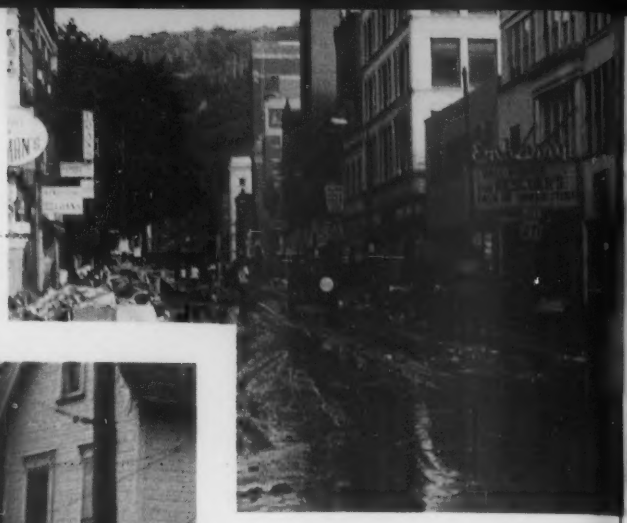
Top left: Guard pilots were able to fly over isolated areas where ground transportation couldn't go.

Below: Pennsylvania Guard aviators assisted in several rescue operations which included pulling trailer park residents off the tops of floating trailers. As the trailers floated together, the gas tanks bumped together, exploding and setting many of the trailers on fire.

GUARD AVIATION ACTION

Right: Main Street in downtown Johnstown two days after the flood. Note title displayed on movie marquee

Below: Vehicles were overturned by flood waters in downtown area



• During the 2½-week period that the Guard aviation units were on the scene, they flew more than 4,200 missions and logged more than 1,400 flight hours ... *without an aircraft mishap* ... despite the high concentration of aircraft and long hours of operation.

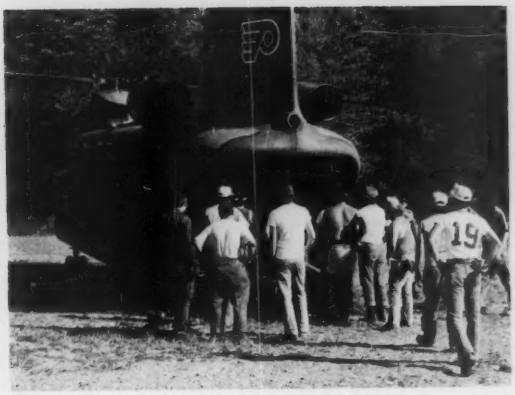
The Pennsylvania Army National Guard, with its 127 aircraft, has the largest Army Guard aviation program in the nation. Of the 50 aircraft used in the Johnstown disaster, 48 were helicopters, including 14 OH-6s, 29 Hueys, and 5 Chinooks. The Guard's two U-3s were also heavily used.

Colonel Bobby G. Hanna, state aviation officer, said, "The morale of all the aviation personnel was high because they were doing what they were trained for."

The impressive performance of the Guard aviation units – from the courageous rescues of the disaster's early hours to the last grueling tasks weeks later – dramatically demonstrated the responsiveness and professionalism of the Pennsylvania Army Guard aviation team.

The vital service performed and high degree of safety achieved by the Guard during this civil emergency are worthy of the highest recognition.

Below: After working 12- to 14-hour shifts, Guardsmen were happy to grab a few hours of sleep on cots set up at a high school



Above: Flood victims line up behind a Guard Chinook to receive food, clothing and water

Left: Damaged vehicles and rubble blocked many areas of Johnstown. With roads blocked or washed away, evacuation of people and delivery of food, water and medical supplies had to be airlifted into remote areas by Pennsylvania Guard helicopters

The horn of plenty symbolizes the many things with which we have been blessed. LSE also can be a horn of plenty for Army aviation personnel. Know, use and take care of your LSE.

Charla Riffee

PEARL'S

Personal Equipment & Rescue/Survival Lowdown

If you have a question about personal equipment or rescue/survival gear, write Pearl, DARCOM, ATTN: DRCPO-ALSE, POB 209 St. Louis MO 63166

ALSE Funding

Why is aviation life support equipment (ALSE) stock funded? This "buy before you fly" status causes many aircrewmembers to fly shortchanged in personal safety and survival equipment.

No one should fly without a full complement of safety, protective and survival equipment. The Army currently is beginning to take another look at possibly making all mission essential equipment procurement of equipment and missiles, Army (PEMA) funded. This will ensure that no one is "shortchanged" because a unit cannot afford to procure the necessary ALSE.

Inspection of ALSE

Before each flight I check out a full complement of aviation life support equipment which includes oxygen mask, survival radios, water survival equipment, etc. How can I be assured that all of this equipment will perform as designed in an emergency?

Some of our aviation units have recognized the critical need to ensure proper operation of their ALSE and have established "out of their hide shops" to store, inspect and maintain their ALSE. Some of these units do not have the proper training or equipment to perform this task, so some visit the nearest Air Force or Navy installation or base for help. The Air Force and Navy have a viable ALSE inspection and maintenance program with trained specialists to do the job. They always have been happy to help out. The Army military occupational specialty (MOS) study for an ALSE specialist is still on the move. Once we get our personnel trained, you can be sure of proper operation of your ALSE in an emergency.

Air Force Flotation Equipment Manual

Do you feel left out because you have not been receiving changes to TO 14S-1-102/TM 5-4220-202-14?

Some of the changes list only the TO but apply to both the TO and TM – an oversight that will be corrected next time around.

Orange Reflectorized Tape

My troop has requested me to order orange reflectorized tape, but am unable to find a stock number for this item.

The tape is not stocked in the supply system. It can be obtained from the 3M Company, 3M Center, TCM Division, Building 223-3N, St. Paul, MN 55101, by ordering Part Number, No. 3483 for $18.30. The tape comes in a 50-yard roll, 2 inches wide.

Obsolete Helmets

Are the APH-5 and AFH-1 obsolete?

The APH-5 and AFH-1 helmets were declared obsolete in September 1972. They should have been reported as excess in accordance with AR 755-1. Do not issue or wear obsolete helmets under any condition. The SPH-4 was classified Standard A in December 1969 and is the only authorized Army flight helmet to be used by personnel in flight status. Retain, maintain and carry your SPH-4 helmet to your next duty station. As a closing thought, PEARL reminds you to be sure your helmet is properly fitted, the chin and nape straps are snugly fastened and that you *do not* use a chin pad.

FOLD

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US Army Aviation Center
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Major General James C. Smith
Commander
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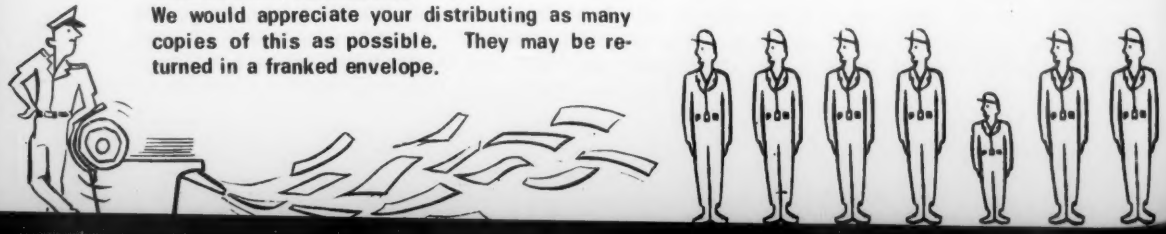
FOLD

I'm interested in your opinion about how training at the U. S. Army Aviation Center can be improved to help you do your job. Write your comments below, detach this page, fold it and mail to me.

Major General James C. Smith

Attention unit commanders:
We would appreciate your distributing as many copies of this as possible. They may be returned in a franked envelope.



Enlisted Personnel Management System

Continued from page 17

them again. Additionally, your family must readjust with each of these moves. If travel is done in the middle of the school year, children must make an additional adjustment.

At many Army installations, your family may remain in government quarters while you are on the short tour, whether your assignment is homebase or advanced. Check with your housing officer on questions you have in regard to leaving your family in government quarters.

O.K., that explains HAAP. Now, how can you influence a HAAP assignment and how reliably does MILPERCEN honor HAAP assignments?

There is currently only one way available for you to influence a potential HAAP assignment. You must submit an Enlisted Preference Statement (DA Form 2635) to indicate where your dependents will reside when you are selected for an unaccompanied tour. You must ensure that item 44, DA Form 2 (that's the green-striped form you have in your 201 file) reflects your CONUS area preference. Indicating your preference to MILPERCEN through these methods is the only way in which you can influence a HAAP assignment.

A HAAP assignment is not a 100 percent guarantee, but MILPERCEN has been able to honor more than 95 percent of all HAAP assignments. So there is a slight possibility your homebase or advanced assignment could be changed. It all depends on requirements and priorities in conjunction with precisely when you are due to complete the short tour. Requirements at various installations must be projected more than 18 months in advance to come up with these assignments. Authorization documents (TDA, MTOEs, etc.) change so that makes the job even more difficult.

When a Soldier is selected to serve an unaccompanied tour, the assignment manager must determine whether the Soldier will be given a homebase or advanced assignment. There are two important factors which the assignment manager considers – location of dependents and requirements. PCS funds are saved by reducing the number of dependent moves; therefore, the HAAP assignment will in all likelihood be near or at the location of the Soldier's family. HAAP assignments generally are made to installations as close as possible to where the family will reside, if a requirement will exist there for the Soldier's grade and skills upon return from overseas.

Korea is currently the area where the largest number of short tour authorizations exist. All other dependent restricted areas also are under HAAP.

There are four things you should remember about HAAP:

- A homebase assignment is different from an advanced assignment.
- HAAP applies only to E5 and above. If you are an E4 when you go to Korea and are promoted to E5 there, you do not qualify for HAAP.
- *KEEP YOUR DA FORM 2635 (PREFERENCE STATEMENT) AND DA FORM 2 CURRENT.*
- Volunteering for a short tour will not guarantee you will receive your assignment of choice when you return.

One last note about HAAP and Korea: If you want to volunteer for Korea, see your personnel staff NCO (PSNCO) and refer to AR 614-30, AR 614-200 and DA PAM 600-8 to guide you in volunteering.

How To Get The DIGEST

THE U. S. ARMY AVIATION DIGEST is an official Department of the Army publication for those having an interest in Army aviation. Official distribution of the magazine is handled by The Adjutant General.

Active Army, National Guard and Army Reserve units under pinpoint distribution should request both initial issue and revisions to accounts by submitting DA Form 12-5, "Requirements for Department of the Army Administrative Publications Other Than Regulations and Circulars." Detailed instructions for preparation of DA Form 12-5 and other pertinent information are on the back of the form.

The completed Form 12-5 should be submitted to:

Commanding Officer
USA AG Publications Center
2800 Eastern Boulevard
Baltimore, MD 21220

National Guard units that are not on pinpoint distribution should submit their request through their state adjutant general.

ATC action line

UNITED STATES ARMY AIR TRAFFIC CONTROL ACTIVITY

CAN SPECIAL visual flight rules (VFR) operations be authorized at an uncontrolled satellite airport without official weather reporting when the visibility is less than 1 mile at the primary airport?

The answer is yes. The authority is Federal Aviation Administration (FAA) Handbook 7110.65, paragraphs 470, 482 and 483, and FARs 91.105 and 91.107. Of course, the satellite airport must be within the control zone. The requirements in FAA Handbook 7110.65, paragraph 482 do not apply and the requirements in paragraph 483 do. The use of the term "flight visibility" in FARs 91.105 and 91.107 is the key and the pilots are bound by these FARs. If pilots advise air traffic control that they have a 1-mile flight visibility, they may be issued a clearance under the provisions of FAA Handbook 7110.65, paragraphs 470, 471, and 472. A flight visibility report from one pilot *cannot* serve as the required flight visibility for another aircraft.

Why bother with Pilot Weather Reports (PIREPs) when we have such modern weather facilities available?

PIREP information concerning the internal makeup of thunderstorms normally is hard to obtain because pilots give thunderstorms a wide berth whenever possible. Yet, once a storm develops, PIREPs are perhaps the most reliable source of current information concerning its operational impact. It is little wonder that other pilots, the National Weather Service, airline dispatchers, controllers, flight service station (FSS) personnel, airport managers, military base operations offices, and others are so interested in these reports.

Controllers, do you get many requests from pilots for the current wind?

If you do, it could be you're missing the opportunity to reduce transmissions and frequency congestion. Why do they ask for it at all? They obtained it either verbally on initial contact or sometime afterward, or it's on the automatic terminal information service (ATIS). No problem if the wind is fairly steady and not too strong. However, if the wind is variable or gusty, pilots have a couple of problems. First, how current was the wind when they received it; and second, how much has it changed? The pilots need current wind information for throttle and aircraft altitude adjustments and, in the case of an air carrier, to determine whether they can legally use a particular runway. Airlines have different company regulations which provide for maximum allowable wind direction and velocity for a particular type aircraft to land on a particular runway. Pilots understand the importance of wind reports. If they don't think they have the latest, they'll ask for it. So, if you believe that the current wind is significant to the operation, give it to the pilots. You not only save a transmission, but the time you choose to give it may be more convenient for you than when they request it.

The application of off-route vectors for airborne aircraft is explained in FAA Handbook 7110.65-683. Is there ever a situation where off-route vectors would apply to nonairborne aircraft?

Yes. If the departing aircraft is to be vectored immediately after takeoff. Additionally, paragraph 771 specifically states "a purpose for the heading is not necessary, since pilots operating in a radar environment associate assigned headings with vectors to their planned route of flight."

What in the world is EFAS?

The EFAS (Enroute Flight Advisory Service) Program is a joint FAA/NOAA (National Oceanic Atmospheric Administration) responsibility to improve the safety of flight operations by providing timely and meaningful weather advisory pertinent to the type of flight intended. It is available throughout the conterminous U.S. from 0600 to 2200 hours at a service criteria of 5,000 feet above ground level (AGL).

EFAS will be provided by specially trained specialists from selected FSSs controlling one or more remote communication outlets covering a large geographical area. All communications will be conducted on the designated frequency 122.0 MHz using radio call (name of FSS) FLIGHT WATCH. All but two of the planned EFAS facilities have been or will be placed into service by the end of 1977.

The importance of this program and its proper implementation and operation cannot be overemphasized. It is essential to the success of the EFAS program that all facilities, EFAS or non-EFAS, actively endorse and support its proper usage. The EFAS or flight watch specialist occupies a unique and responsible position. During the hours of EFAS operation, the flight watch specialist will not operate the regular inflight position. The EFAS position is a single, individual position and has to be operated as such. Only an EFAS qualified specialist will operate the EFAS positions, and EFAS will be provided only during the scheduled 16 hours except where the available staffing permits 24 hours daily service.

Readers are encourged to send questions to:

Director
USAATCA Aeronautical Services Office
Cameron Station, Alexandria, VA 22314